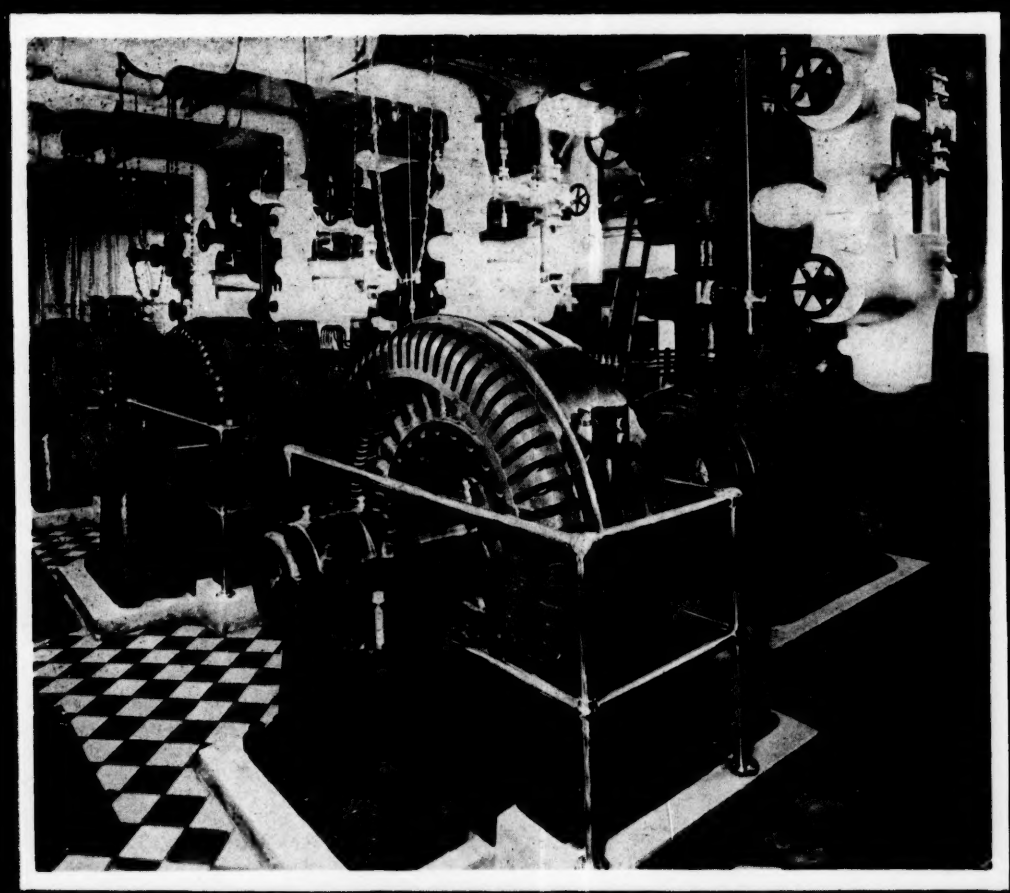
ICE and REFRIGERATION



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JULY • 1953

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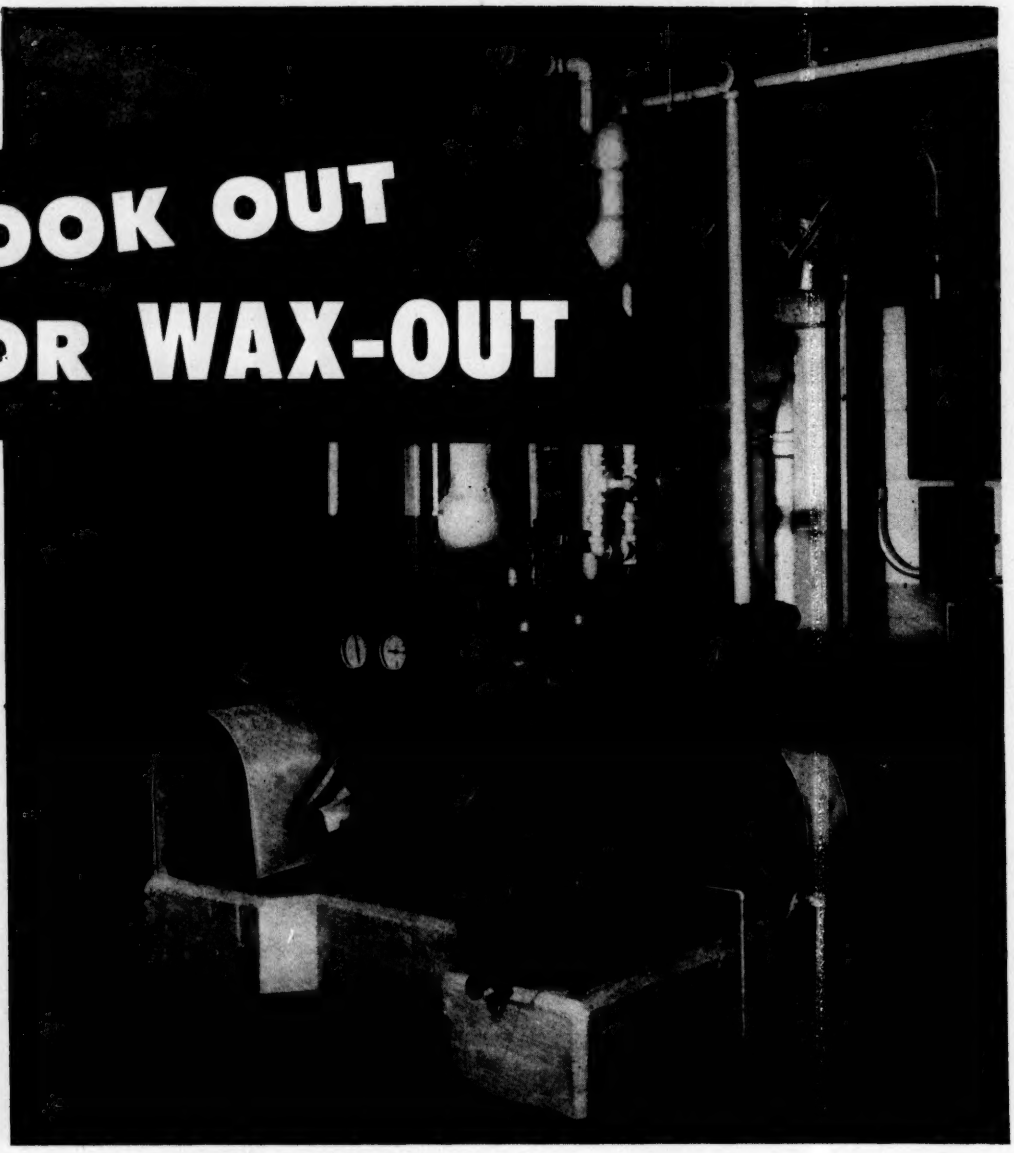
LOOK OUT FOR WAX-OUT



WHEN an ordinary refrigerating oil "waxes out" in your compressor system, look out! Cooling efficiency will go down and maintenance costs go up. Change to *Texaco Capella Oil (Waxfree)*. It won't precipitate wax in systems — not even down to minus 100° F.

Texaco Capella Oil (Waxfree) has outstandingly low haze and floc temperatures. Its purity, stability and oxidation-resistance are tops, too. *Texaco Capella Oil (Waxfree)* does not foam, is moisture-free and will not react with refrigerants. Ideal for better performance and lower maintenance costs whatever your refrigerating range.

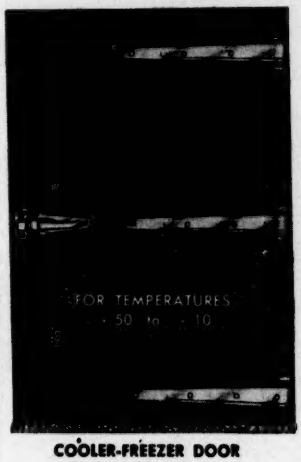
There is a complete line of *Texaco Capella Oils (Waxfree)*. They come to you purity-protected in *refinery-sealed* containers — 55-gallon drums, 5-gallon, 1-gallon or 1-quart packages.

Call in a Texaco Lubrication Engineer for consultation on your refrigerating problems. Just contact the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

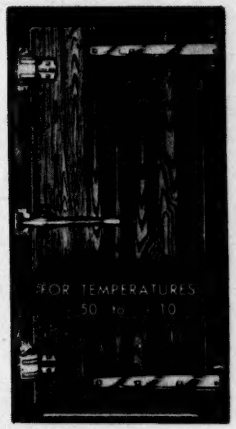
TEXACO

TEXACO Capella Oils (Waxfree)

FOR ALL REFRIGERATING AND AIR CONDITIONING COMPRESSORS



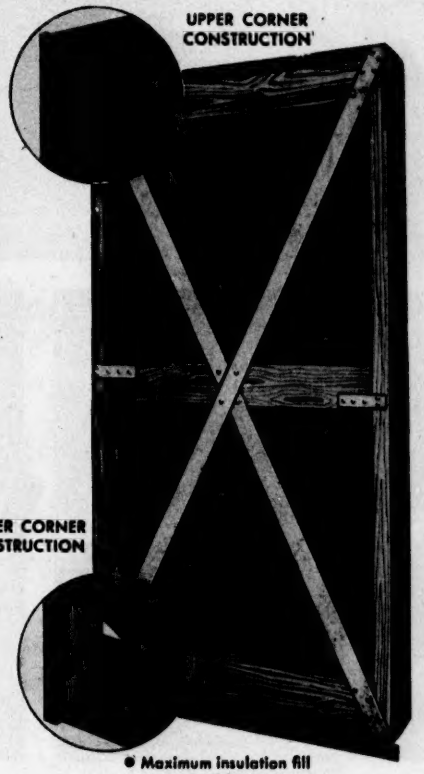
COOLER-FREEZER DOOR
- Modern streamlined job
- 100% "Douglas Fir"
- Sanitary hardware



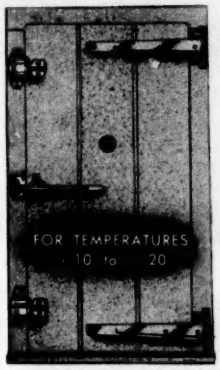
X-52 PLYWOOD PANEL DOOR
- Plywood front and back
- Extra heavy-duty hardware
- Special type gaskets

UPPER CORNER CONSTRUCTION

LOWER CORNER CONSTRUCTION

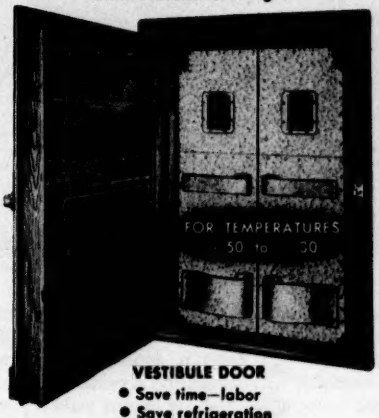


- Maximum insulation fill
- Most possible rigidity
- Allows reversal of swing



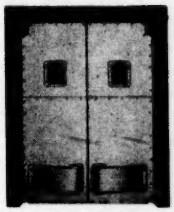
LOW TEMPERATURE DOOR
- Entire metal-clad front
- Extra heavy-duty hardware
- Special type gaskets

SUPER FREEZER (OVER-LAP) DOOR
- Extra-heavy construction
- Extra-heavy duty gaskets
- Extra heavy-duty hardware

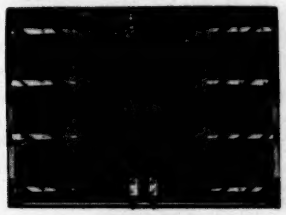


VESTIBULE DOOR
- Save time—labor
- Save refrigeration
- Large plant operation

TRACK DOOR
- For abattoirs
- Meat handling rails
- Banana rooms

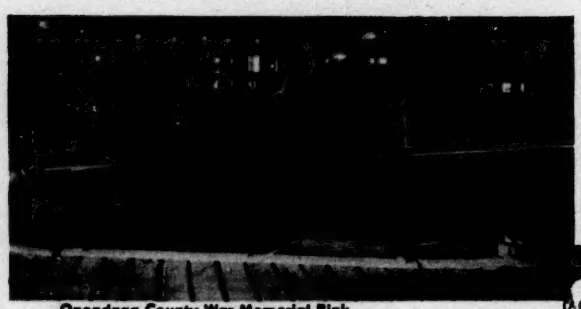


AUTO-CLOSE DOOR
- For loading dock
- Intra-cooler doors
- Heavy trucking



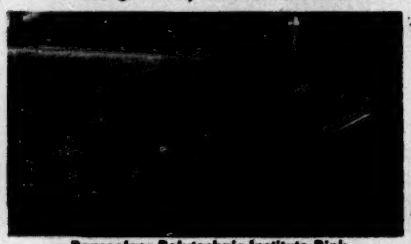
DOUBLE DOOR
- For palletizing
- For carloading
- For elevator shafts

BUTCHER BOY REFRIGERATOR DOOR CO. • HARVARD, ILL.



Onondaga County War Memorial Rink

Denver Municipal Stockyard Stadium Rink



Rensselaer Polytechnic Institute Rink

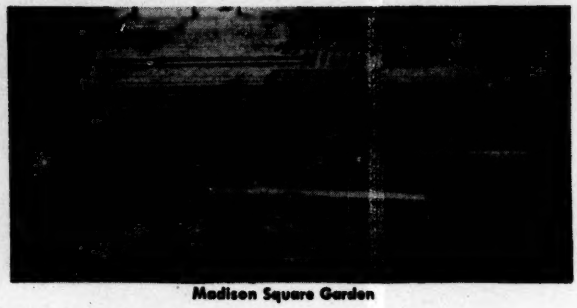
Wellman Memorial Rink

Here's why—

IN THE PAST 7 YEARS—

25 ICE SKATING RINKS used BYERS WROUGHT IRON PIPE!

Cambria County War Memorial Rink



Madison Square Garden

Why "skate on thin ice" when you can play it safe with wrought iron pipe? Proof of this material's superior dependability and durability is its outstanding acceptance record—over 80% of all ice skating rinks built in the United States in the past 7 years have used wrought iron pipe.

There are good reasons for this confidence. Take fabrication, for instance. In bending operations, wrought iron takes short radius bends, without "springback." This feature speeds and simplifies the job. When the design calls for welded fabrication, users report that wrought iron produces a sound weld, free of pinhole leaks. In threaded and coupled joint design, wrought iron's uniform structure assures sharp, clean, full-depth threads. And during installation, wrought iron pipe's ample mechanical strength withstands damage.

In actual service, wrought iron's ability to combat corrosion, and serve longer at lower cost per year is a matter of engineering record. Tiny fibers of glass-like silicate slag, threaded through the body of high-purity iron, halt and detour corrosive attack, discourage pitting. They also anchor the protective scale, which shields the underlying metal.

You'll find it profitable to investigate wrought iron's many installation and service advantages for ice rinks. Our bulletin, *Wrought Iron in Refrigeration and Air Conditioning Systems,* reviews several installations. Write for a copy, or let us know your particular problem.

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WROUGHT IRON

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ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

ICE and Refrigeration

VOLUME 125 NUMBER 1

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July, 1953

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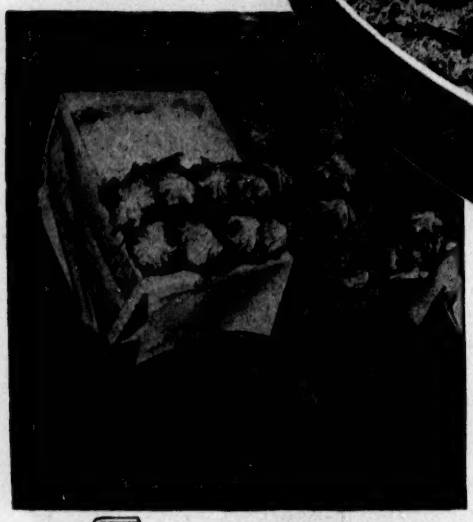
Delivered Delicious...

A final layer of Vogtice is put in place before closing the crate.

Layers of Vogtice are placed on the crate bottom and between the courses of lettuce heads.



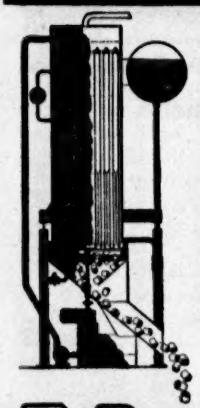
Harvesting lettuce in the field with a traveling conveyor which delivers the heads to a truck.

...straight from the Nation's "Salad Bowl"

Head lettuce from the Salinas Valley, California "Salad Bowl" graces the tables in American homes from coast to coast. In the season, shipments will average 135 refrigerator cars daily.

The J. J. Crosetti Packing Co. with headquarters at Watsonville, California is one of the largest growers and packers and operates a battery of four Vogt Automatic Tube-Ice Machines to provide Vogtice for carload shipments. The crates of iced lettuce are loaded in refrigerator cars and then a protective blanket of Vogtice is blown over them to retain freshness and crispness for distant markets.

Vogtice is playing an increasingly important role in the cooling, processing and preservation of foods and beverages. Our new Bulletin TI-3 gives the general information and will be sent upon request.



HOW THE TUBE-ICE MACHINE FUNCTIONS

In making ice, water is pumped to the top of the freezer and flows downward along the inside walls of tubes into a water tank. Refrigerant in shell surrounds tubes and freezes water into cylinders of ice. An automatic timing mechanism operates suitable valves to control all functions of the machine. Ice is freed from the tubes by thawing when the refrigerant is displaced by high pressure warm gas from the compressor.

Employing direct application of the refrigerant, all expense incidental to other systems is eliminated.

Patent Numbers 2,200,424, 2,230,234, 2,300,300, 2,444,814, 2,453,148.

HENRY VOGT MACHINE CO., LOUISVILLE 10, KY.

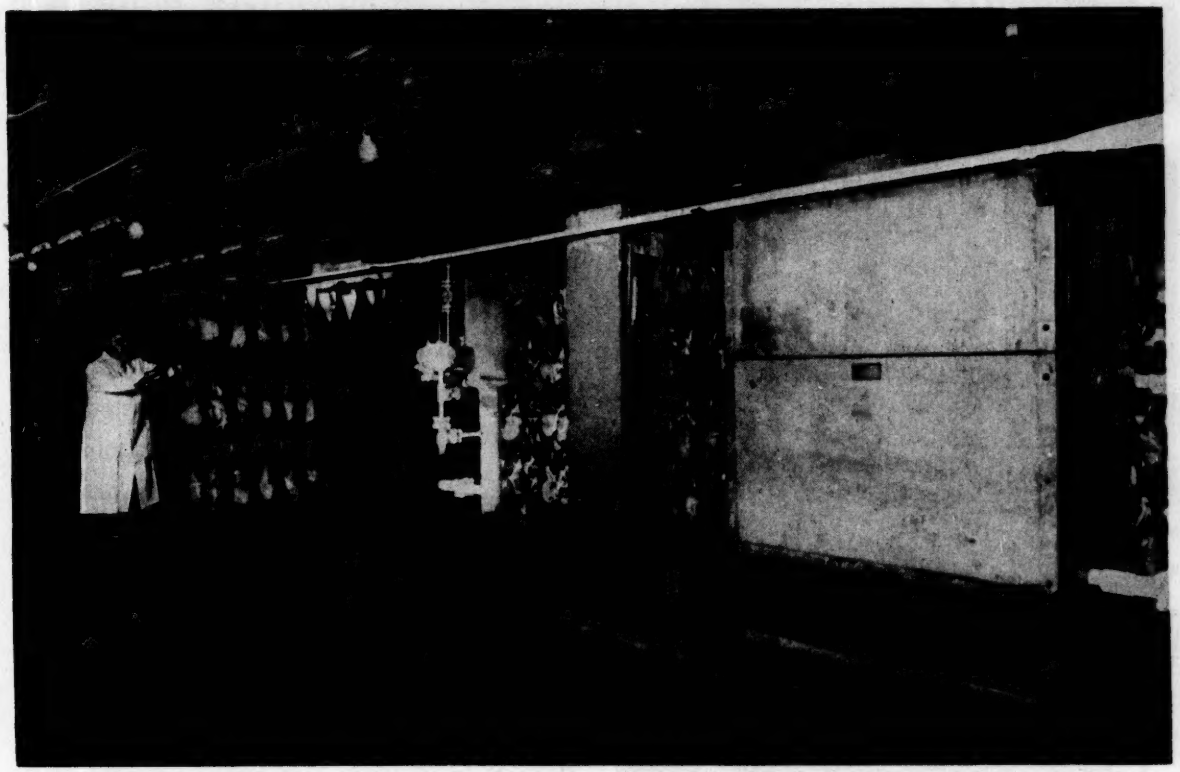
BRANCH OFFICES: NEW YORK • PHILADELPHIA
CLEVELAND • CHICAGO • ST. LOUIS • DALLAS

Vogt Automatic TUBE-ICE MACHINE

ammonia refrigeration

has taken the hex off hams at A & B

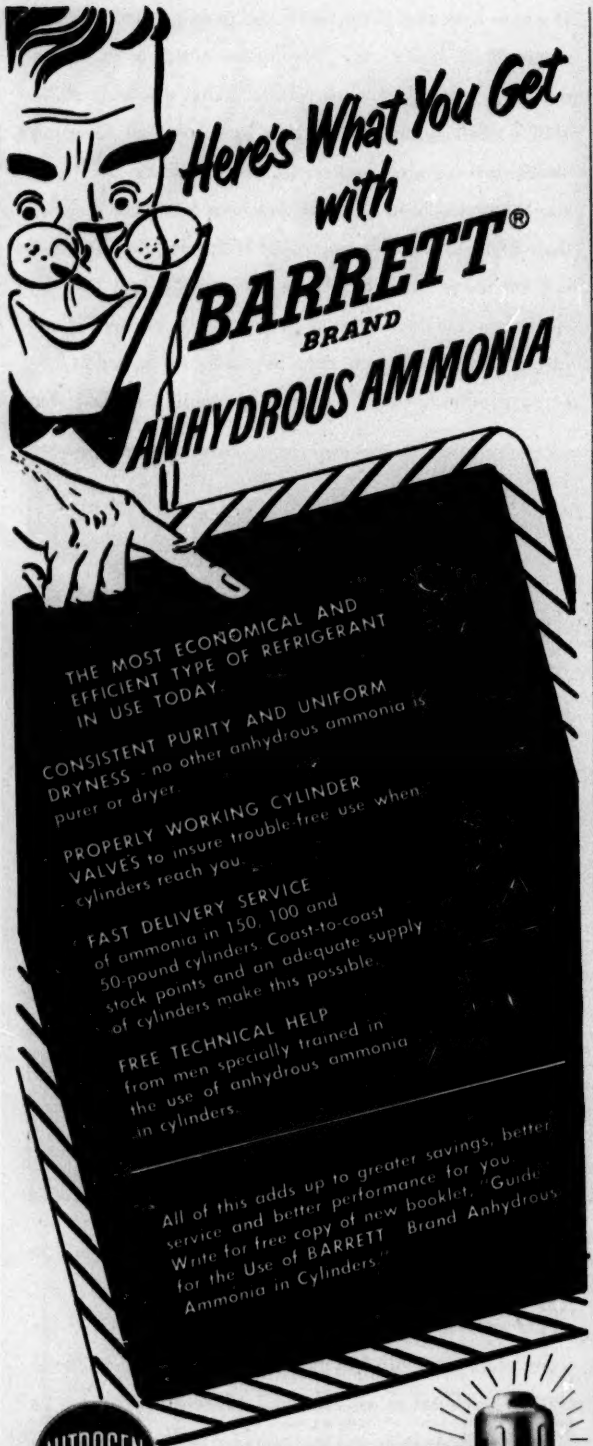
If a ham went bad in the pickle cellar, folks used to blame a sign of the Zodiac, the phase of the moon or a temperamental hog. Lots of hams spoiled. That was back in the 1880's when Arbogast & Bastian Inc. were just becoming established as meat packers in Allentown, Pa. ▪ Not a single ham has been lost since Arbogast & Bastian installed their first Carrier Ammonia Cold Diffusers more than two million hams ago. The hams are quickly and literally chilled to the bone and then kept from shrinking and losing weight by bathing them in moving air cooled to 37°. ▪ So profitable is this faster, even cooling method that



A & B now have five Carrier-equipped chill rooms, plus other Carrier Ammonia Cold Diffusers for bacon freezing, pickle cellars, fresh meat rooms. Refrigeration for the entire plant is supplied by two Carrier Centrifugal Refrigerating Machines in an ammonia condensing system. ▪ This same dependable service from Carrier Ammonia Compressors, Ammonia Evaporative Condensers and Ammonia Cold Diffusers is available to you for whatever food cooling requirements you may have. And with these perfectly matched components, you can be sure of peak efficiency throughout your entire refrigerating system. For full details, write Carrier Corporation, Syracuse, New York.

Carrier

ammonia refrigerating equipment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BRAND
ANHYDROUS AMMONIA
THE MOST ECONOMICAL AND EFFICIENT TYPE OF REFRIGERANT IN USE TODAY
CONSISTENT PURITY AND UNIFORM DRYNESS - no other anhydrous ammonia is purer or dryer
PROPERLY WORKING CYLINDER VALVES to insure trouble-free use when cylinders reach you
FAST DELIVERY SERVICE of ammonia in 150, 100 and 50-pound cylinders Coast-to-coast stock points and an adequate supply of cylinders make this possible
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Nitrogen Division

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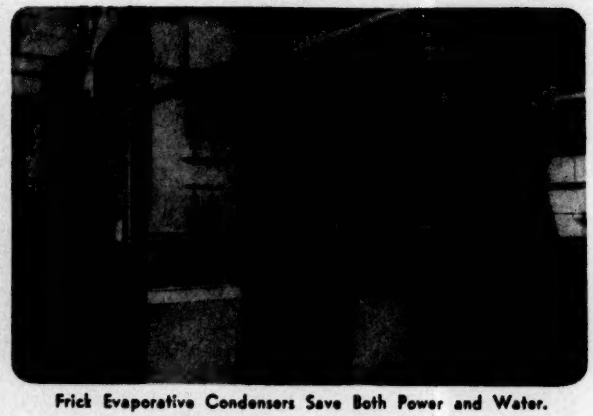
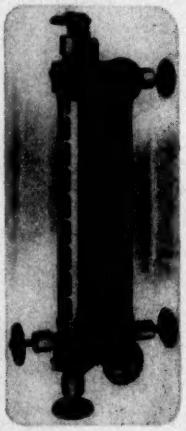


Frick Evaporative Condensers Save Both Power and Water.

Save Money with Modern



Purgers keep condensing pressures down: patented manual and automatic types available.

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Your refrigerating system will operate more efficiently with this up-to-date equipment. Built in types and sizes to meet your exact needs—whether for ammonia or Freon. Let us quote now on your requirements: write, wire, phone or visit.

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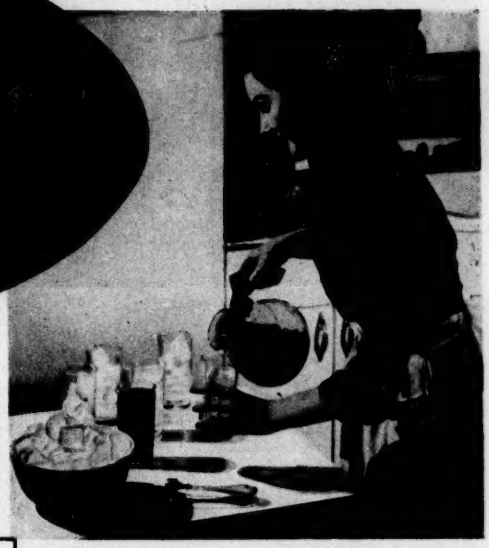
Also Builders of Power Farming and Sawmill Machinery

Shell Condensers, Receivers, Oil Separators, Gas-and-Liquid Coolers, Accumulators and Precoolers are Furnished in All Sizes.

TAKE A TIP FROM A MAN WHO'S MADE IT PAY

Henry L. Dithmer
Executive Vice President
Polar Ice & Fuel Company
Indianapolis, Indiana



Henry L. Dithmer tells you why Polar Ice & Fuel Company prefers Union Ice Bags: "We bought our first paper bags from Union in 1932 and now use almost 400,000 a year. Naturally when it became apparent that the most improved method of merchandising prepared ice was in wet strength bags, we again turned to Union. Their bags are tops in quality and appearance, and always are fairly priced."

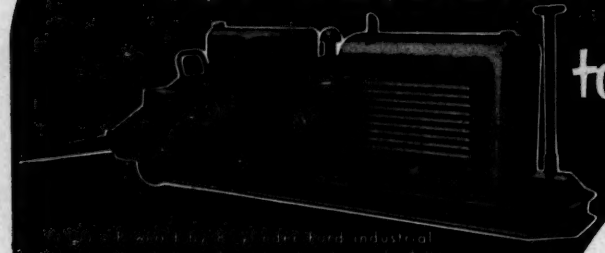
PACKAGE ice in wet strength paper bags and take advantage of the opportunity to suggest additional uses on the sides and back of the bag. Turn good customers into "best" customers.

PAPER-BAGGED ice looks cleaner, is cleaner, Sanitary container invites both family and commercial users to keep cubes and cracked ice more readily available, use it more often.

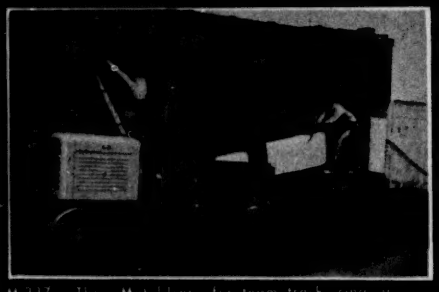
SELL your brand name and telephone on your paper ice bag. Encourage "impulse" buying, special orders for parties. Ice bag advertising costs practically nothing — pays off big.

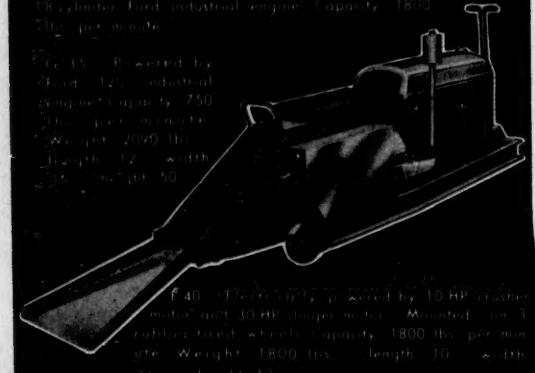
WIN new customers through attractive appearance of the container and by word-of-mouth recommendation. It's good business to make a good impression on your customer's neighbors.

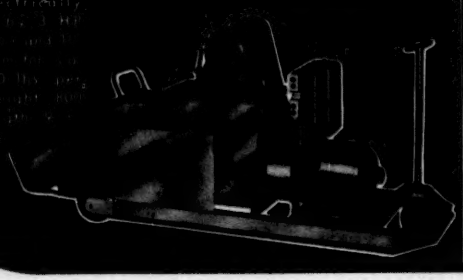
TOP PERFORMANCE is the KEY to ECONOMICAL ICING!



use TRI-PAK Icing Equipment







Tri-Pak Icing equipment is built for top performance for particular job operations — for icing requirements vary in different areas and operations. Tri-Pak's dependable, size-rated equipment for these different operations is the key to smooth, economical icing. Five models of ice crusher-slingers are offered by Tri-Pak for you to size-rate your operation for maximum results with the best in equipment.

Besides ice crusher-slingers, Tri-Pak has crushers, slingers, conveyor arrangements and accessories. The new Ice-Scalator makes bunker icing of refrigerator cars easier, faster and much more economical.

Write for your icing equipment catalog and complete details.

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MACHINERY SERVICE, INC.
HARLINGEN, TEXAS
MODESTO, CALIFORNIA
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for dependably dry, pure, uniform

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COLORADO
Denver — The Chemical Sales Co.

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Waterbury — Apothecaries Hall Co.

DISTRICT OF COLUMBIA
Washington — Henry M. Sweeny Co., Inc.

FLORIDA
Jacksonville — Apperson Chemical Company
Miami — Biscayne Chem. Laboratories, Inc.
Tampa — Graves Bros. Refrig. Supplies Co., Inc.

GEORGIA
Atlanta — Southern States Chemical Co.
Savannah — F. H. Ross & Co.

IDAHO
Boise — Van Waters & Rogers, Inc.

INDIANA
Indianapolis — Wm. Lynn Chemical Co., Inc.

IOWA
Cedar Rapids — Cherry-Burrell Corp.
Sioux City — Kennedy & Parsons Co.

KANSAS
Wichita — Barada & Page, Inc.

KENTUCKY
Louisville — Merchants Chemical Co., Inc.

LOUISIANA
New Orleans — Whitman-Holloway-Olivier

MARYLAND
Baltimore — Leidy Chemicals Corp.

MASSACHUSETTS
Boston — A. E. Borden Co., Inc.
Fall River — Borden & Remington Co.
Holyoke — Eastern Chemicals, Inc.

MICHIGAN
Detroit — Davis Supply Co.
Flint — Davis Supply Co.

MINNESOTA
St. Paul — Cherry-Burrell Corp.

MISSOURI
Kansas City — Barada & Page, Inc.
St. Louis — Barada & Page, Inc.

NEBRASKA
Omaha — Kennedy & Parsons Co.

NEW JERSEY
Newark — National Oil & Supply Co.

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Binghamton — Collier Chemical Co.
B'klyn — Robinson Bros. Chemicals, Inc.
Buffalo — Buffalo Brewers Supply Co.
Rensselaer — Eastern Chemicals, Inc.
Rochester — Scobell Chemical Co., Inc.
Syracuse — Eastern Chemicals, Inc.

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Greensboro — F. H. Ross & Co.

OHIO
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OKLAHOMA
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Portland — Van Waters & Rogers, Inc.

PENNSYLVANIA
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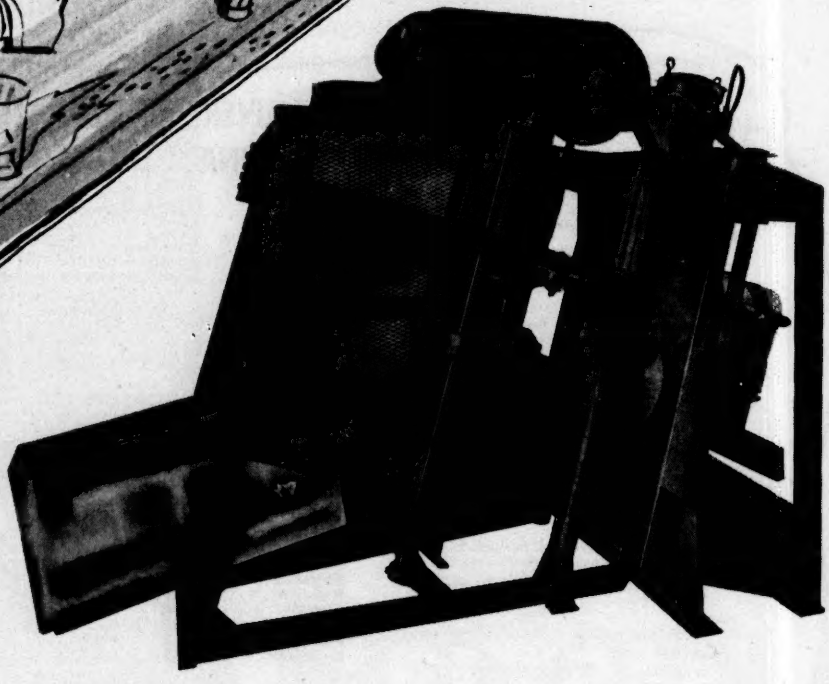

Completely automatic, this Gifford-Wood Type A Cuber shoots out perfect ice cubes at the rate of 26,000 per hour and minimizes ice waste. It accommodates a 300- to 400-pound cake which is held firm on the loading plate, aligned with the precision cutting saws. And, as soon as this first cake is ¾ cut, a second cake slides easily into place pushing the remaining quarter into the saws. This means no waste—every piece of ice is saleable. There's a further benefit, too—all parts coming in contact with the ice are not only sturdy, but completely corrosion-proof—your guarantee of minimum maintenance cost. For full information, write for Bulletin 488.

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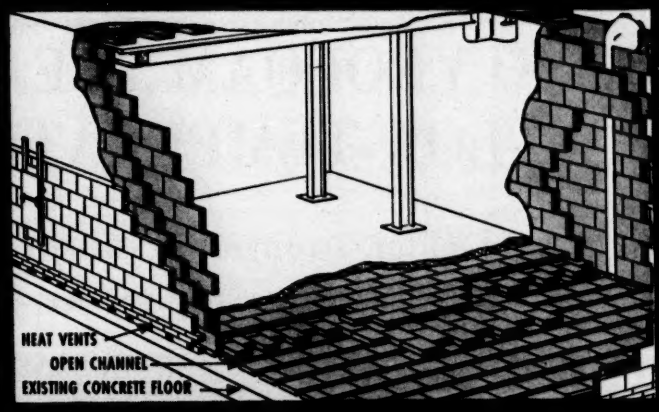

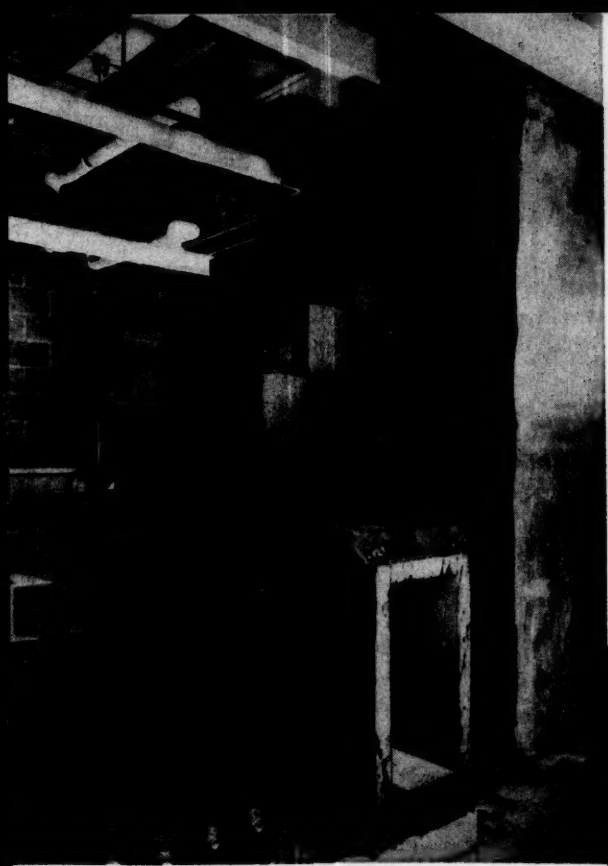

When Luick Ice Cream Co. (Milwaukee Div. of National Dairy) constructed a new ice cream hardening room to handle increased business, they used FOAMGLAS, the rigid, cellular glass insulation, for walls, floor and ceiling. Luick found:

The exceptional compressive strength of FOAMGLAS, able to bear the weight of a concrete floor and roof supporting columns, allowed them to construct their new hardening room *within* the existing plant structure by installing FOAMGLAS directly on the old floor. This construction method saved them two months time and the cost of floor excavation or additional exterior construction.

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In the Spotlight

PECANS, unshelled or shelled, should be placed in refrigerated storage if they are to be held after April 1, according to results of experiments conducted by the Georgia Experiment Station over a period of ten years. For details see article on page 15.

A MULTI-MILLION dollar rehabilitation and expansion program has been instituted by the Chicago Great Western Railway at Oelwein, Iowa to provide a strictly modern plant for icing refrigerator cars. For description and pictures of the mechanical handling system installed see article starting on page 17.

NEW CONSTRUCTION providing addition freezer and cooler space has been added by The Crystal Ice & Cold Storage Company, Phoenix, Arizona. Mechanical handling equipment is used throughout. For description and pictures see page 20.

A SAFETY GOAL of one million man hours and one million truck miles with no injuries and no accidents has been set up by the Southland Corp., by W. F. Leonard, Jr., in charge of Safety for the company. For further details and pictures see page 23.

A PORTABLE CONVEYOR for icing refrigerator cars in locations remote from an ice plant has been designed and is being used by the Royal Palm Ice Company of Florida. For description and pictures, see page 21.

THE ANNUAL REPORT of the Refrigeration Research Foundation for 1952 reveals the wealth of information that has been developed from practical research. Approximately twenty major research projects were carried on in various agencies and institutions. A summary of this report starts on page 29.

COVER: Picture of new engine room in Pfeiffer Brewing Plant, Detroit, Mich. A descriptive article, with pictures, on the complete remodeling of this plant will appear in the September issue.

ANHYDROUS AMMONIA as a valuable soil fertilizer is being sold to farmers by the Union Service Corp., Columbus, Ohio. It provides a good sideline for other ice plants. For details see article on page 24.

THE PACIFIC STATES Cold Storage Warehousemen's Association held its annual convention at Coronado, Calif., April 22, 1953. Among the subjects discussed were storage of fruits and vegetables, plant safety, legal liability, standardized pallets, and revision of safety orders. For report see page 27.

FOLLOWING LOSSES suffered from flood damage in 1951 the Midwest Cold Storage & Ice Corporation, Kansas City, Kans., built a new warehouse on concrete piling to raise it above flood damage. For illustrated description see page 33.

SNOW, ICE and frozen ground conditions are being tested by scientists working for the U. S. Army's Corps of Engineers in sub-zero laboratories at Wilmette, Ill., a suburb of Chicago. Details and pictures are in the article on page 35.

RECORD FROZEN FOOD pact was established in 1952 according to figures released recently by the National Association of Frozen Food Packers. See page 42. Greatly increased demand is reflected in unusually heavy withdrawals from refrigerated warehouses.

60 Years Ago

From the July 1893 Issue of ICE AND REFRIGERATION

BEFORE the advent of the more or less perfected system of modern cold storage, the egg trade of the century ran in time worn commercial channels from year to year, with monotonous regularity and sameness. Winter usually brought scarcity of stock and consequently high prices, these last depending upon the degree of severity of cold and the depth and spread of snow over the country at large. Prices of eggs under the stimulus of the proper kind of weather would sometimes go up to 50 cents a dozen in carload lots in the big markets of the country, but usually prices ranged through the earlier winter months at 25 to 30 cents a dozen. With the advent of February and southern eggs, prices would ease off, usually to 20 to 25 cents and with March and universally heavy receipts, prices would fall in New York to 13 and 14 cents per dozen, New York virtually setting the pace for other markets.

OF ALL PLACES in the world, Refrigeration of Fish in Trawlers — New Orleans would seem to be the last where the "impure ice" craze would find lodgement; but about a month ago it broke out there with all the fury of an epidemic, and the theory that "chemicals were used in the water by some manufacturers to reduce the cost" was gravely discussed by the learned reportorial staff of certain daily papers. A filter slightly out of order was no doubt at the bottom of the trouble, while now and then a little rust may have appeared in the "core." The excitement has subsided and the "daily bulletins" have been discontinued.

THE ICE RAILWAY by DeLa-Vergne and T. L. Rankin in the Midway Plaisance at the Chicago Worlds Fair is now in operation and running full with pleasure seekers. The novelty affords a delightful sensation in itself, as every tobogganist may imagine, and it is especially "taking" from the fact that the sleds fly down the long slide on real snow and ice.

THE FRUIT EXHIBITS at the Worlds Fair have demonstrated that apples can be satisfactorilly carried over from their season well into the following summer without appreciably loss of quantity or quality . . . They may be picked in the fall and held in cold storage and drawn on for daily consumption.

BIG TONNAGE CONTROL FOR SHELL AND TUBE COOLERS

75 to 200 TONS F-12

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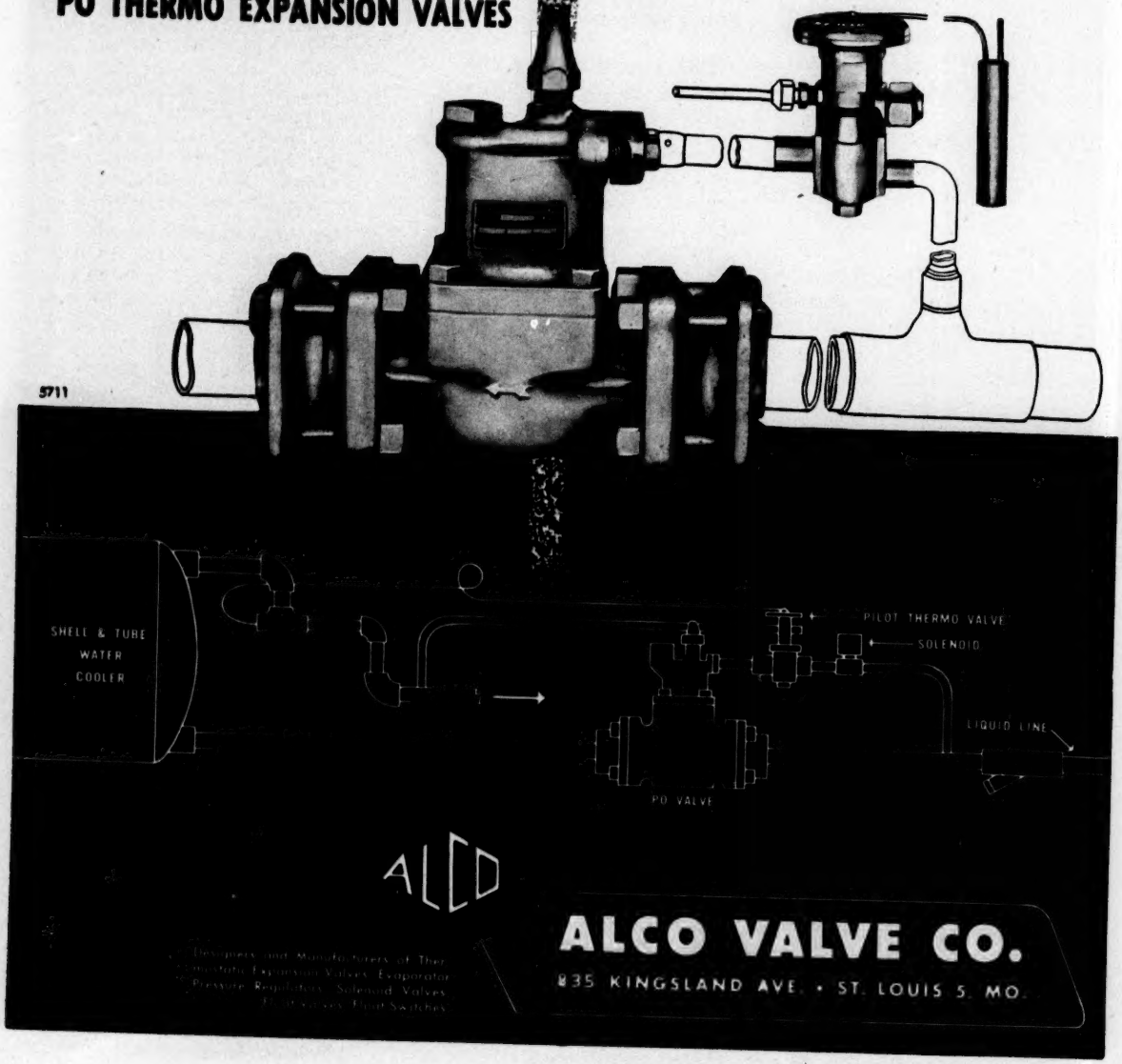


Keeping Pecans In Refrigerated Storage

J. G. WOODROOF
E. K. HEATON
Georgia Experiment Station
Experiment, Ga.

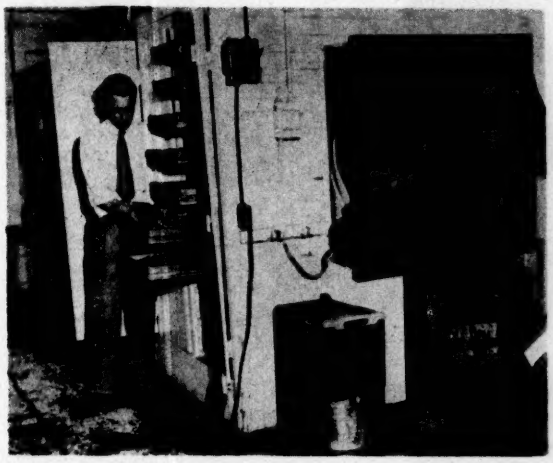


Fig. 1—Interior of a drying room of a pecan shelling plant showing: (A) trays stacked 10 tiers in the drying tunnel; (B) fan for blowing air through the trays in the drying tunnel; (C) gas heater for warming the air to approximately 100 F; (D) an electric dehumidifier for keeping relative humdiity as low as possible.

Fig. 2—Unshelled pecans are usually stored in 125-pound burlap bags in a room separate from other products. The rooms are filled practically to the ceiling, with little aisle space.

IT is necessary that pecans—unshelled or shelled—be placed in refrigerated storage if they are to be held after April first. If a year-round supply is to be maintained, they should have been stored under refrigeration much earlier.

Experiments conducted at the Georgia Experiment Station over a period of 10 years show that in handling pecans it is most important to keep them dried to a safe moisture content (4.0%), protected from insects, rodents, and loss of natural color and flavor, and to prevent the development of staleness, rancidity, and foreign flavors. Proper refrigerated storage does all of these.

Pecans may be cold stored shelled or unshelled. Most pecans for bakeries, confectioners, salters, or ice cream makers are cold stored in the shell for several months near the point of production, then removed and shelled, shipped to the end user, and cold stored until made into products. Shelling reduces the weight to about one-half and reduces the volume to about two-fifths, depending upon the variety; it also reduces the storage life to about one-third. Corrugated boxes for shelled pecans are about twice as expensive as burlap bags for unshelled pecans. As shelled halves and large pieces remain fresh longer than medium or small pieces, it is recommended that only the former be stored, while the latter should be used soon after shelling.

Experiments over several years have shown that pecans properly stored under refrigeration for as long as six or nine months will hold up in pecan products as long as freshly harvested and cured nuts will hold up in these products.

Recommendations

Following are recommendations for refrigerated storage of pecans:

Begin with clean dry rooms. At

Fig. 3—Pecan meats are usually stored in 30-pound corrugated cartons which are usually waxed or lined with parchment.

This paper based on research sponsored in part by The Refrigeration Research Foundation; published as No. 241 Journal Series.

Fig. 4—Cartons of pecan meats badly stained by oil that "crawled" from the broken pieces. Rancidity was greatly accelerated by the added exposure to air. Refrigeration caused the oil to solidify and practically eliminated staining of the cartons.

least once each year the walls and floors should be scrubbed, dry, or with a detergent, then disinfected with a chlorine (hypochlorite) or similar solution, after which they may be sprayed with a cold water paint or whitewash. The relative humidity should be maintained at from 65 to 70 percent for pecan meats to avoid excessive moisture and molding on one hand, or to prevent the nuts from becoming too dry and brittle on the other. For unshelled pecans 70 to 75 percent relative humidity was satisfactory.

Inspect pecans before and during storage. For the protection of the owner of the pecans, as well as the warehouseman, a record of the U. S. Grade, weight, moisture content, rancidity (if any), general appearance, and percent of discolored, insect-infested or moldy nuts, should be made at the time of storage. Pecans in storage should be examined monthly for possible mold, discoloration, or absorption of foreign flavors.

Maintain temperature from 28 to 32 F. All of the advantages of refrigerated storage may be had at 30 to 32 F except when it is desired to keep pecans for more than one year; then 28 to 30 is recommended. A temperature below 32 F should be used only when it is desired to dry out nuts while still in storage, and then the temperature should be raised to 32 F after drying is complete. Pecan meats in fiberboard containers stored at 28 F for more than a few weeks may become too dry and brittle, resulting in excessive breaking. There was no objection to storing unshelled pecans below freezing temperatures, and no injury occurred when pecans were stored at 0 F or lower. A blower type evaporating unit with Freon refrigerant is recommended.

Store pecans alone or only with other dry, odor-free products. This is because pecans readily absorb moisture and odors from the atmosphere or from other stored products. Permissible products include rice, dried seed, dried milk, dried eggs, candies, other nuts, blocked chocolate, and canned or bottled goods. Products not recommended include fresh fruits or vegetables, fish, cheese, and cured meats.

If undesirable odors develop in the storage room, remove them as quickly and completely as possible, first by removing the source, then by the use of carbon filters, or other mechanical means. There is no practical means for removing strong, foreign odors that have actually been absorbed by the pecans.

Ammonia fumes turn the skin on pecan meats black and render them unmarketable. Pecans are so sensitive to ammonia that minute traces, even too weak to detect by smell, cause injury during long storage. Since there is no practical means of permanently removing the dark color, they must be protected from ammonia by suitable packaging or by storing only in an ammonia-free atmosphere.

Tests for Shrimp Quality

AN interesting report was made by Dr. E. A. Fieger and his associate, J. J. Friloux at the Boston meeting in June of the Institute of Food Technologists on objective tests for quality in shrimp. From his studies with juries of tasters, Dr. Rieger has concluded that after about seven days in ice, fresh shrimp have lost their characteristic sweet flavor. Then for about another seven days they continue without spoilage (but loss of flavor) before spoilage sets in adequately for the development of off flavors.

There is need for a simple, practical test that will show where any given lot of shrimp stand in this course of change toward complete loss of quality, and he will report on studies of four chemical tests. One that measures amino nitrogen seems to give results closely correlated with the decline as measured by the taste panels. The tyrosine reaction was shown to have little value. Measurements of trimethylamine nitrogen and volatile acids indicated whether or not spoilage had occurred but did not give information on pre-spoilage changes. An efficient test for this purpose is needed throughout the fisheries industries for various species.—TRRF Information Bulletin.

Study on C-Rations

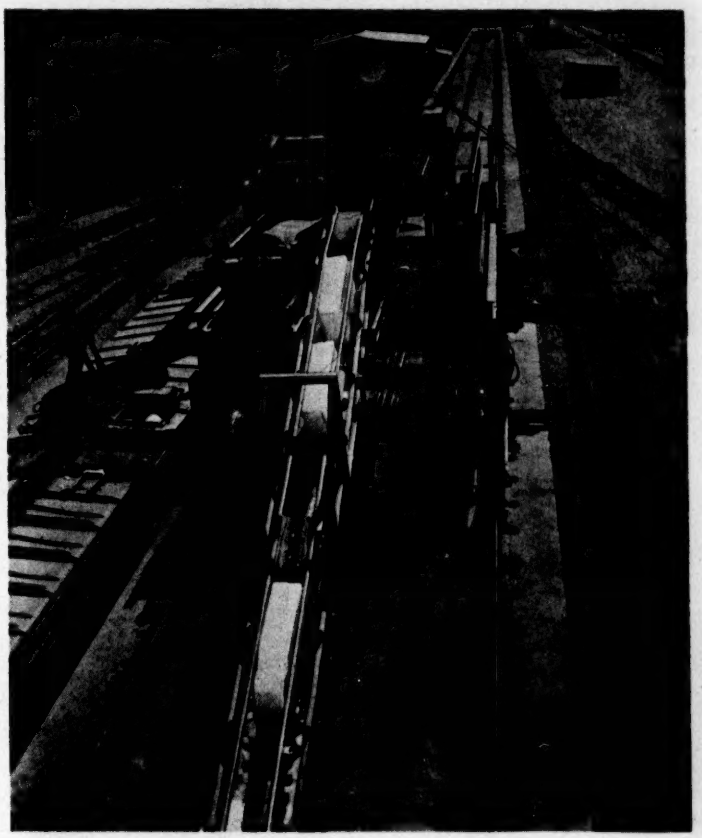
AT Georgia Agricultural Experiment Station, Dr. J. G. Woodroof is undertaking a short investigation to determine whether or not and to what extent, if any, moisture condenses on the packages and components of the combat ration package (C Ration) when it is removed from refrigerated storage at different temperatures and relative humidities to ordinary room temperature. This study is closely related to his studies on packaged candies which have been mentioned in previous bulletins and in ICE AND REFRIGERATION.

The study will include the influence of variations in temperatures and relative humidities in the refrigerated storage rooms and in the rooms to which the rations are removed. By a careful study of containers, packaging materials and components of the samples of rations under the varying conditions, it is hoped that many relationships of the variable conditions to moisture condensation can be established. The ultimate aim is to determine whether or not rations stockpiled under low-temperature conditions will retain their original quality over long periods.—TRRF Information Bulletin.

Mechanical Handling Ices Refrigerator Cars at New Icing Dock

WHEN the Chicago Great Western Railway pushed west from Chicago shortly before the turn of the century, Oelwein, Iowa, quickly became the hub of its operations. For the past 50 years it has been the railroad's key division point. At Oelwein the Great Western's lines fan out in four directions—to St. Paul-Minneapolis, Omaha, Kansas City and Chicago.

During the past year the townspeople at Oelwein have watched the progress of a multi-million dollar rehabilitation and expansion program by the railroad. Old structures have been torn down and replaced. From the yardmaster's tower to the yard offices and depot, everything has been rebuilt. The Chicago Great Western even moved some of its offices from Chicago to Oelwein, making Oelwein more than ever the center of its operations. Probably the most spectacular contrast between old and new is found in the railroad's icing operation.



The Link-Belt dock-type car icer at Oelwein, Iowa, re-ices bunkers at the rate of one and one-half to two minutes per car. Ice travels down the dock from the ice house on a chain conveyor and then up onto the icing machine, which crushes the ice, salts it and delivers it to bunkers.

New Ice Plant

A new ice plant, designed to manufacture 62 tons of ice a day and store 400 tons, has been built; and a new 700-ft. concrete icing dock, complete with Link-Belt self-propelled dock-type car icer, has been installed. Besides the car icer, Link-Belt furnished a conveyor system for handling ice within the ice house, a conveyor for carrying ice along the dock, and a salt storage and conveying system.

Numerous refrigerator cars for fresh meat and perishable farm produce that require re-icing arrive at Oelwein daily. Formerly the bunker icing and salting were done manually. Now, blocks of ice are conveyed mechanically through the ice storage room and then along the dock to the Link-Belt dock-type car icer. The blocks ride up automatically onto this machine and are crushed into chunks which slide down hinged chutes to the bunkers.

Icing Machine

The icing machine moves down the dock from bunker to bunker, icing cars on either side or on both sides of the dock at once, if desired. All operations, including the movement of ice along the dock, are controlled by one man, using push-button controls in the cab of the icing machine. Refrigerator cars are bunker-iced in one and one-half to two minutes per car.

The new ice house and icing dock have been in operation about a year. Space is provided for an additional 700 feet of dock to be installed at a later date. This would increase the capacity of the dock to 50 cars.

Ice Handled Mechanically

The new ice plant is one of the most modern ice manufacturing and storage buildings in existence. Everything is completely new, and designed for Oelwein's particular re-icing requirements.

The 300-lb. blocks of ice are handled mechanically within the ice storage room by a Link-Belt trolley conveyor which moves the ice from manufacturing to storage and from storage to the dock conveyor serving the car icer.

This conveyor, 146-ft. centers, is made of Link-Belt drop-forged Rivetless chain suspended at 30-in. intervals from two-wheel trolleys riding on the bottom flange of an I-beam track. It travels in a straight line, between horizontal sprocket wheels at each end, about 30 inches above the floor. The return run is about 4 feet above the floor. Pusher bars, spaced at intervals on the chain, slide the blocks of ice along an ice run on the floor.

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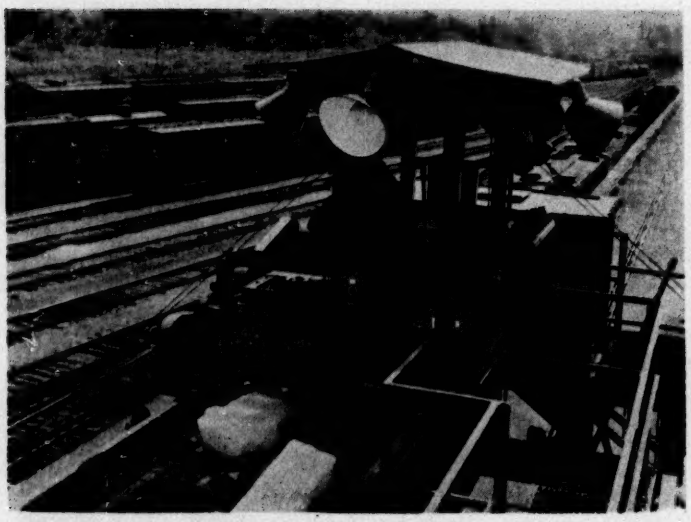
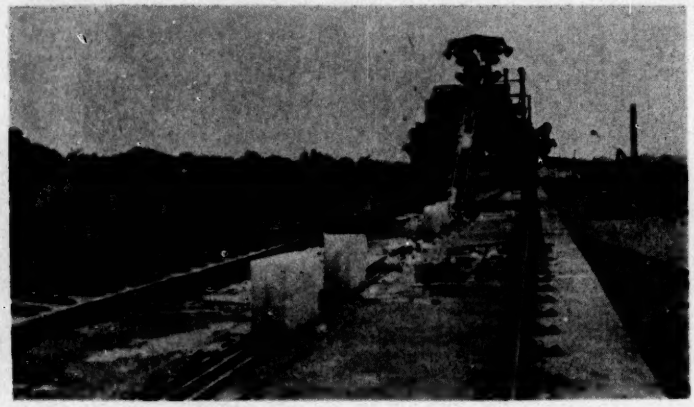


Close-up of operator's platform, steel slat apron conveyor and crusher. One man, using push-button controls, moves the machine along the dock, operates the crusher rolls, raises and lowers the discharge chutes and pick-up conveyor, controls hydraulic gates over bunkers and the flow of salt from the salt bins.



Blocks of ice are carried down the dock from the ice house to the Link-Belt car icer by a chain conveyor.

In the ice house, a trolley conveyor system moves ice from manufacture to storage, then out of storage to the dock conveyor.

Conveyor

The conveyor for moving ice along the dock is 685 ft. long. It employs Link-Belt SS steelbar link chain. Attachments for pushing the ice are spaced at 10-ft. intervals. This conveyor, driven by a 25-hp motor through a Link-Belt enclosed herring-bone gear drive, travels 180 ft. per minute.

Dock Type Car Icer

The Link-Belt dock-type car icer is a self-propelled machine which travels on rails on the concrete dock. It is designed to do both bunker-icing and bunker-salting in one operation, serving refrigerator cars on each side of the dock. It is also equipped with an ice crusher slinger for direct top-icing of perishable produce with finely crushed snow-ice.

Ice blocks traveling down the dock on the dock ice conveyor are intercepted by the inclined pick-up conveyor on the icing machine, which carries them up the incline to a reversible slat apron conveyor. The pick-up conveyor consists of two strands of RC precision steel roller chain with pusher attachments. It is operated at 180 feet per minute through a Link-Belt gear-motor.

Apron Conveyor

The apron conveyor which feeds the blocks into the crusher is made of steel slats mounted on class SS bushed steel chain.

The crusher has three cast steel rolls with hardened steel picks. It is adjustable so that chunk size can be regulated by changing the position of one of the two primary rolls or by engaging or disengaging the third roll.

The crushed ice falls into a reversible distributing conveyor running at right angles to the dock. This is a flight conveyor, consisting of two strands of class SS bushed chain with steel flights, driven by a Link-Belt gearmotor.

The ice is discharged at either side of the dock into a boom chute which directs the chunks into bunker hatches. Hydraulically operated by-pass gates in the chutes direct the ice into either the inboard or outboard bunker, as desired.

Salt Bin

Salt is carried in a bin on a trailer which travels with the machine, using the same tracks. Ten pounds of salt per second are fed from the bin to the boom chutes by screw feeders. Timing controls measure the amount

of salt going into each bunker. The icing machine will handle chunk ice to the bunkers at the rate of 18 cakes per minute or 162 tons per hour.

Top Icing

When cars require top-icing of produce, the apron conveyor is reversed, sending ice itno the ice crusher slinger. This reduces it to fine particles resembling snow. The snow-ice is directed uniformly over and between tiers of containers, completely blanketing them for protection. By this method, the slowly melting ice maintains safe temperatures and preserves the moisture content of the produce. The ice crusher slinger has a capacity of 16 cakes per minute.

Thes dock-type car icer is driven at a speed of 300 feet per minute by two Link-Belt Electrofluid drives, which provide quick and smooth acceleration. While the machine is traveling from bunker to bunker, blocks of ice can be accumulated on the inclined pick-up conveyor and on the apron conveyor feeding the crusher, and crushed ice can be held on the reversible distributing conveyor.

Though seemingly complex, this machine is but a combination of various types of Link-Belt conveyors, crushers and power transmission machinery, all carefully integrated for smooth performance.

Salt Supply

Salt for the icing machine is stored in a stationary tank adjacent to the end of the icing dock. It is conveyed from railroad car to tank and from tank to icing machine by Link-Belt conveying and elevating equipment.

A power unloading scoop speeds unloading of salt from box cars. The operator draws the scoop into the box car. The scoop is connected by wire rope to a winding mechanism which winds the rope and pulls the loaded scoop to the discharge point, pouring the salt into a hopper.

The salt is carried by an inclined screw feeder to a centrifugal discharge bucket elevator and thence to an overhead, reversible distributing screw conveyor which discharges it into the storage bin or directly into the salt bin of the car icer.

When the salt bin of the car icer is being loaded from the storage bin, the discharge chute at the base of the storage bin is opened, permitting the salt to return to the screw feeder, to be elevated once more in the bucket elevator. The overhead distributing screw conveys the salt through a hinged extension spout into the salt bin of the car icer.

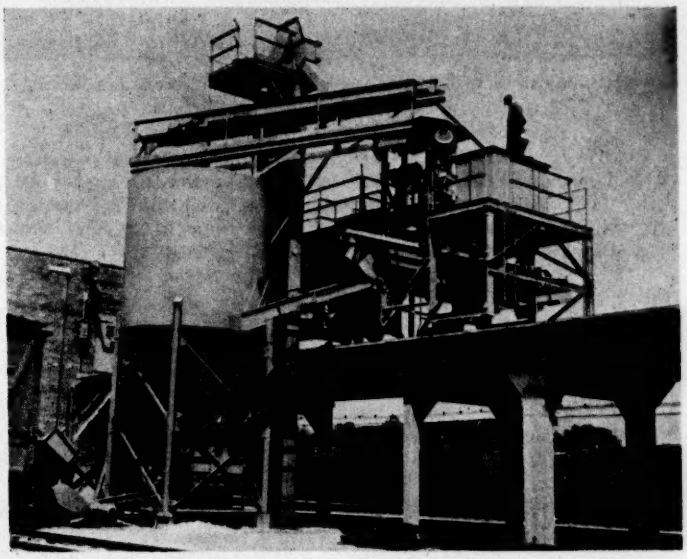
By mechanizing salt handling, manual handling and spillage has been eliminated. Cars of salt can be unloaded quickly on the day they arrive.

System Proves Successful

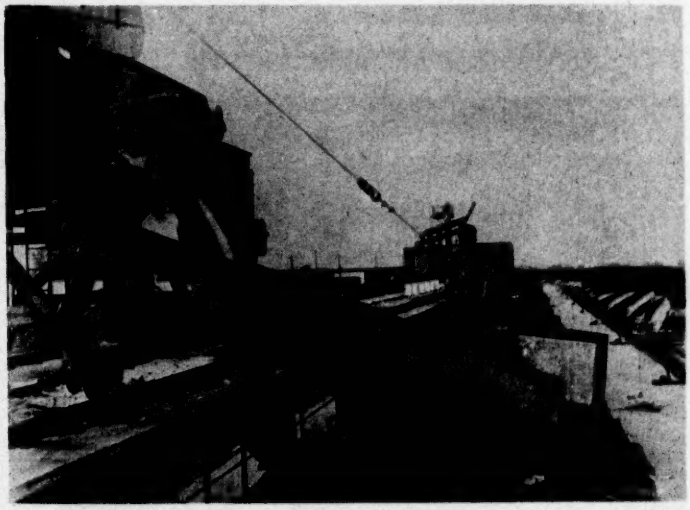
The system of re-icing refrigerator cars at Oelwein has proved highly successful, according to J. H. Sawyer, Jr., engineer for the Chicago Great Western.

Trains of cars are re-iced promptly on arrival in Oelwein, speeding up the delivery of perishable produce at its destination.

Close-up of drive unit for propelling dock-type car icer along dock.

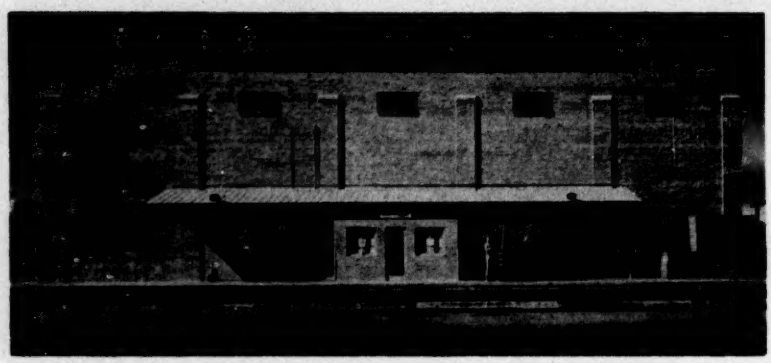


Salt storage bin and conveying equipment for handling 10 tons per hour of rock salt from railroad cars to storage and to car icer shown being loaded with salt.



Discharge chutes of car icer have hydraulically operated by-pass gates which direct the ice into either the inboard or outboard bunker. Note the flow of ice and salt into the chute, and ice house, salt storage bin and dock ice conveyor at far end of dock.

New Warehouse Addition Provides Freezer All Mechanical Handling

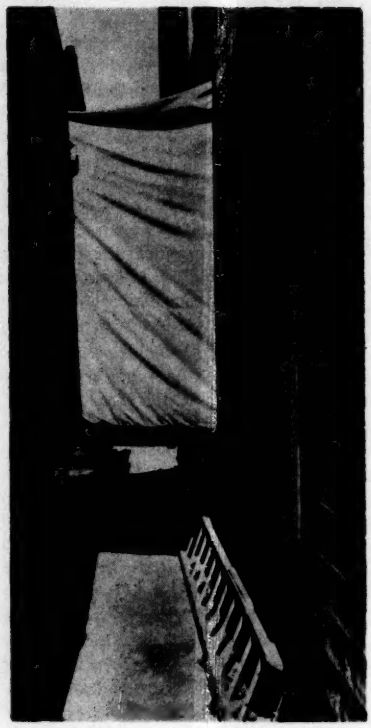


Front view of New Warehouse addition of Crystal Ice & Cold Storage Company, Phoenix, Ariz.

A NEW refrigerated warehouse addition constructed by The Crystal Ice & Cold Storage Company, Phoenix, Arizona, is now in operation. The building is 96 x 94 ft. inside, with 20 foot ceilings, containing approximately 180,000 cu. ft. under refrigeration, providing the company with a total of 325,000 cubic feet freezer space and 64,000 cubic feet of cooler space which will fill the requirements of that area at the present time.

This company has for a number of years operated a cold storage warehouse in Phoenix with 149,000 cubic feet refrigerated space. This location being unsuitable for expansion for warehouse purposes, the company in April 1951 purchased the property, plant and warehouse of the Arizona Frozen Foods Company at 2100 West McDowell Road in Phoenix. This warehouse has 60,000 cubic feet of freezer refrigerated space and was leased back to the former owner in its entirety.

Plans were drawn for much needed additional freezer space and a building was constructed immediately north of and adjoining the present building. This new building (see picture) is a one story, brick construction insulated with Palco wool, has two blower type refrigerating units supplied with a bank of five ammonia compressors, which supply both warehouses. The floor in the new plant is marked off into bays and the bays are divided by



Weatherproof hood between warehouse and car keeping even temperatures.

letters. Therefore the location of each article is pinpointed and can be located

(Continued on page 48)

Right: Stacking cartons of frozen food in refrigerator car.

Below: Moving cartons of frozen foods with fork truck.

THE ICE INDUSTRY

NATIONAL ASSOCIATION OF ICE INDUSTRIES

Executive Offices
1706 L St. N.W., Washington 6, D.C.

Executive Secretary
Guy W. Jacobs, Washington, D.C.

President
Wm. J. Ayers, Memphis, Tenn.

First Vice-president
Paul H. Andres, Oklahoma City, Okla.

Second Vice-president
E. L. Gunn Jr., Atlanta, Ga.

Treasurer
Geo. Steers, Jr., Kalamazoo, Mich.

THIS MONTH IN BRIEF

A portable conveyor for icing refrigerator cars has been used very successfully by the Royal Palm Ice Company of Florida. The conveyor was built on a conventional delivery truck with power take off made from rear ends of junked trucks.

The Southland Corporation, Dallas, Texas under direction of W. F. Leonard, Jr. set up a safety goal of one million truck miles with no accidents over the entire system of operations in 42 Texas cities.

Selling anhydrous ammonia as an agricultural fertilizer has developed into a profitable sideline for an ice plant. A Columbus Ohio ice man tells how they did it.

An ice exhibit at the Washington State Restaurant Convention attracted much favorable attention, with displays of carved, block and cube ice. It was sponsored by The Ranier Ice & Cold Storage Company in cooperation with the Northwest Association of Ice Industries.

Conveyor Trucks Solve Car Icing Problem

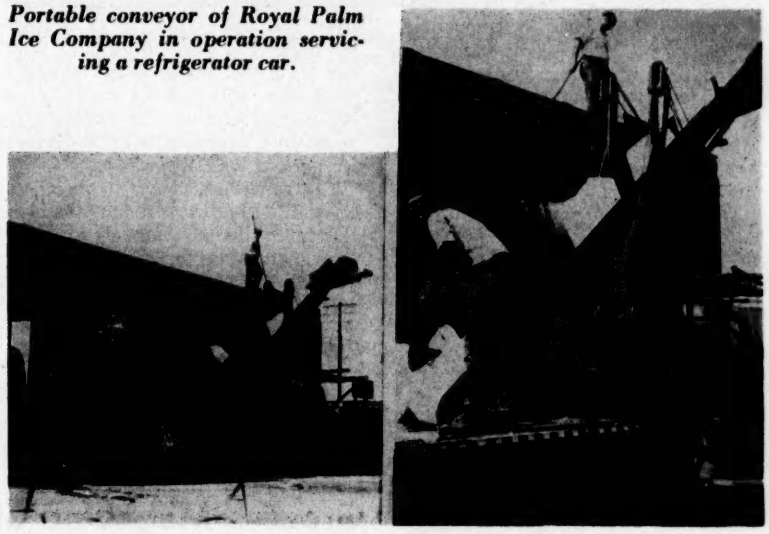
A SPECIAL portable conveyor for use on refrigerated freight cars has been used very effectively by the Royal Palm Ice Company of Florida. Throughout most of the country it is customary to bring the cars to the ice plant and load them on a siding with a chute provided for this purpose. That is the ideal method when there is an ice plant available.

However, in the Florida fruit and vegetable regions hundreds of carloads of produce are often shipped from remote areas during only a few weeks of the harvest season. Cars are often run out on sidings right into the fields. Naturally, it is not feasible to have ice plants in these locations when they would be in operation only a small portion of the year. Consequently refrigerated cars often had to be iced down at plants miles away from the loading point. If this was done before loading it resulted in a considerable waste of ice. There was the alternative of loading the produce first then rushing the car to the nearest icing point; but this always left the risk of spoiling. Also some vegetables such as corn should be carried in a pre-cooled car.

The need for icing on the spot became so obvious that for years the Royal Ice Company hauled ice by truck to packing houses and there loaded the cars with ice by hand. This method was back breaking and time consuming, so the ice company's engineers began working on a way to do the job mechanically. The conveyor shown here is the result of several experiments with final improvements by Frank Raymond of the Royal Palm Plant at Miami, Fla.

These loaders are built on a conventional delivery truck at a cost of $600 to $700. Power take off is made from rear ends of junked trucks and is attached above regular transmission.

Portable conveyor of Royal Palm Ice Company in operation servicing a refrigerator car.



Hundred pound pieces of ice are carried to the top of the conveyor and a slanted chute extends to the opening in the car. One truckload of ice is ample for a refrigerated car and only two men are required to conduct the entire operation. As a matter of fact, the main need for more than one man is to drive the extra truck. Ice truck and conveyor truck are placed back to back and one man feeds the conveyor. The man on top merely keeps the chute clear of broken pieces and occasionally places a piece in the car.

Needless to say, this is quite an improvement over loading by hand. In addition to the time saved it provides ice when and where it is needed —not before or after. The Royal Palm Company has fourteen plants in Florida and most of those in vegetable and fruit producing areas are equipped with these conveyor trucks.

The Ice Industry

Our Greatest Safety Device

SLOAN CHILDERS
Safety Director
Southwest Ice & Dairy Products

UNLESS people can be made to think Safety and be so imbued that he will want to do everything the safe way, all the preaching in the world will not make a safe worker of him. If a man wants to be safe and keeps the thought uppermost in his mind, he will naturally do the safe thing provided that he has been taught the correct way to do the job. No matter how conscientious he may be or how much he desires to work safely, unless some one can show him the right way he will have to learn by trial and error.

One job that is cut out for us is to increase the number of companies, cities, schools, civic organizations and individuals organized and working for safety. Each safety-minded unit needs to become a nucleus around which others will grow until safety becomes a national ideal and way of life.

Certain fundamental facts must be accepted to bring this about. The first fact is, that accidents are a serious menace to all mankind—so serious that they threaten the life and happiness of every individual man, woman and child.

The second fact is, that accidents do not merely "happen"; each one results from definite causes which may be detected and dissected.

The third fact is, that there is a remedy for each accident, and that all accidents may be prevented by removing or safeguarding against the causes.

The chief reason we continue to have so many accidents is that not all men and women have accepted these fundamental truths, or, if they do believe them, they do not work hard enough to apply them.

Experience is a cruel teacher and safety lessons learned by human suffering are at great cost. Only through careful, conscientious safety study and work can the sad lessons of the past be applied to prevent future suffering.

We must not only believe in and accept these principles of safety, but we must apply them every day of our lives. Where there is ignorance, ignorance must be corrected; where there is apathy, apathy must be replaced with interest and enthusiasm. The key-note is persistence. We must go at this business of safety as if it were a life-long job—which it is.

Container Preserves Fish Without Ice

A TEST model of new iceless refrigerated fresh fish container for less-than-carload quantities was demonstrated recently by the Canadian National Railways at the annual meeting of the Fisheries Council of Canada. The container, designed by engineers of the C.N.R. research and development department, will enable fishery plants to ship direct to small retailers. It can also be used for other perishable commodities.

Employing a chemical solution to provide refrigeration, the container now makes it possible for pre-chilled fresh fish to be delivered in the same condition that it left the plant. Shrinkage of fish has been largely reduced while in transit, it is reported. During a series of tests, the experimental container demonstrated its ability to maintain shipment of fresh fish pre-chilled to 29 degrees for periods of over three days with less than one degree gain. Standard containers will have a capacity of 160 pounds and will be expected to maintain a temperature of 29 degrees for periods over three days.

The container shown to members of the Fisheries Council features aluminum double-wall construction throughout. The space between the walls is filled with block insulation. Refrigeration is achieved by an eutectic mixture of sodium sulphate and water contained in sealed rubber tubes mounted in removable aluminum plaques. The latter are placed to completely screen the load from outside heat.

Ice Anaesthetic For Heart Operation

MRS. Harriet Null, who was packed in ice for 90 minutes before heart surgery, said after the operation she "didn't feel the cold at all." The refrigeration method was used by surgeons at Michael Reese hospital, Chicago, because they felt Mrs. Null, 34, would not survive the conventional technique.

She had been bedridden for 17 months before that. The day after the operation she was walking about under her own power.

Indiana Association of Ice Industries

Robt. W. Walton, Secretary

THE Indiana Association of Ice Industries is now in the process of planning a cooperative newspaper program for Indiana ice men. Rates are being accumulated and sample advertisement prepared which will be sent to members for approval at an early date. Every effort is being made to plan an effective program at the lowest possible cost.

Remove Tax From Ice Plants in Florida

THE legislative act exempting ice plants from provisions of the Florida Chain Store tax became law May 15, without the Governor's signature. Legislative sponsors of the bill said the state would lose only $1500 by elimination of the ice plant chain tax.

Grocers Magazine Shows Chickens on Ice

AN effective publicity effort on ice for dressed poultry was instigated by "Prof" Davis of the Union Ice Company, San Francisco. "Prof" posed a bathing beauty in an ice storage room surrounded by a flock of dressed chickens on crushed ice. The California Grocers Advocate ran the eye-filling photo reproduction on its March 13 cover. It also carried a "poultry on ice" story by Mr. Davis inside. The article referred to "two kinds of chickens on ice" . . . the young lady and the dressed birds. The picture also appeared in Food Field Reporter, with resulting added publicity for "chicken on ice."

In the article the point is made that poultry on ice is big business and describes the modern processing and merchandising methods in handling ice chilled poultry.

Southland Corp. Sets High Safety Goal

THE Southland Corporation, Dallas, Tex., under direction of W. F. Leonard, Jr., director of safety and insurance has set up a safety goal. Effective April 1, the company hoped to achieve one million truck miles with no accidents over the entire system of operations in 42 Texas cities.

This company has been safety conscious for many years and, under direction of Mr. Leonard, has already achieved a very satisfactory record of decreasing injuries and accidents with a consequent lowering of insurance rates for all of the 42 branch plants.

Fort Worth

The Southland plant at Fort Worth, Texas, has an established policy of being safety conscious and to that end is endeavoring to set up a perfect accident record in 1953. The picture below was taken at a recent driver's safety meeting at which safe drivers awards of sterling silver pencils engraved with the company name, name of driver, and years of safe driving, were distributed. This group represents a total of 2,360,400 accident-free miles.

Lockhart

The plant at Lockhart, Texas had operated 1265 days, a total of 55,660 man hours, with no lost time injury to any employee, when the above picture was taken. Although this is a small plant, experience has shown that safety work pays.

Shown in the above photo are a group of employees of the Southland Ice Corp. ice delivery department, Fort Worth, Texas. Standing in front of the truck are W. F. Leonard, Jr., director of safety and insurance for Southland; R. L. Curtis, 22 years, 330,000 miles; E. L. Doyle, 12 years, 96,400 miles; Grover Redford, 11 years, 160,000 miles; O. K. Irvine, chief engineer; R. F. McConnell, Manager, 17 years, 300,000 miles; George Beef, Houston Fire & Casualty Company. In the truck: C. W. Cone, 4 months, 6,000 miles; C. D. Gentry, 2 years, 40,000 miles; Mike Miramontez, 2 months, 1,500 miles; Harold Clements, 2 years, 50,000 miles; Howard Clements 10 years, 350,000 miles; Travis Talley, 10 years, 100,000 miles; G. D. Palmer, 11 years, 140,000 miles; Carl Sliger, 7 years, 146,000 miles; B. D. Howell, 6 years, 83,000 miles; Joe Key, 8 years, 130,000 miles; Paul Florence, 2 years, 25,000 miles; Clyde Gray, 6 years, 200,000 miles; Herbert Sliger, 2 years, 25,000 miles.

San Marcos

Observing 1825 days of operation, including 160,000 man hours of work with only one lost time employee injury were the employees of The Southland plant at San Marcos, Texas. This group has a total of 24 years safe driving, with 415,000 miles. The picture below was taken at a recent safety meeting held at the San Marcos plant.

Employees of the Southland plant at Lockhart, Texas: Floyd Kirksey, ice service man, 9 years, 100,000 miles; Louis Bartling, engineer and assistant manager, 7 years, 70,000 miles; Al. Bluhm, chief engineer, has 10 years with no injury in his ice plant work; R. Peyton Kelley, local manager, 300,000 miles; Floyd Tate, constable; W. F. Leonard, director of Safety and Insurance.

Employees of Southland plant at San Marcos, Texas. Herbert Nix, manager, 7 years, 135,000 miles; W. F. Leonard, Jr., director of Safety; E. M. Casillas, ice service man, 3 years, 75,000 miles; John Rangel, Jr., ice service man, 7 years, 95,000 miles; H. J. Trejo, ice service man, 7 years, 110,000 miles; Wilmer Rigby, chief engineer, 6 years, with no injuries in his ice plant work.

From a talk presented at annual convention of Ohio Association of Ice Industries by Morgan G. Williams, Union Service Corp., Columbus, Ohio.

A tank trailer designed specially for handling agricultural anhydrous ammonia.

Selling Anhydrous Ammonia to Farmers A Sideline for an Ice Plant

THE new business of selling anhydrous ammonia for agricultural use was inaugurated by The Union Service Corp., Columbus, Ohio, four years ago. As a new business it has had its growing pains, but it is a product that is needed and the huge market is constantly growing.

Studies and experiments by the U. S. Department of Agriculture and a number of State Experiment Stations paved the way for this market. It was found that agricultural soils, depleted of nitrogen by over-cultivation, can be renewed by the application of liquid anhydrous ammonia, which contains a high percentage of nitrogen. Soils treated this way have shown greatly increased yields.

This is a big field because of the need for increased farm production, and the fact that nature will not replace the fertility of soil as fast as it is taken out by growing crops.

An indication of the acceptance of this product by farmers is shown by figures from many states, typical of which are some from Missouri. In 1949, according to fertilizer inspection records, Missouri farmers purchased 174 tons of anhydrous ammonia. In 1950 this amount increased to 2,376 tons, and in 1951 to 3,978 tons. During the first six months of 1952, 7,778 tons were used.

Side Line to Ice Business

Our company has been very successful in handling this product as a side line to the ice business, particularly since we enlarged the program two years ago with more adequate equipment and storage facilities. Our plan is based upon establishing dealerships in a number of Ohio cities. These dealers, for the most part, do not apply the ammonia, but market it direct to the applicators who make a business of applying fertilizers. Our company does have some applying equipment and does a small amount of this work but only on a testing and experimental basis. One employee, Charles Wood, devotes his entire time to this side line.

The ammonia is applied direct to the soil by means of an "applicator," consisting of a tank mounted on wheels with small pipes leading into the soil somewhat like a wheat drill. The applicator is pulled by a tractor and the driver regulates the flow of the ammonia into the soil about two to three inches beneath the surface.

On fall seeded small grains the application may be made any time from the late summer until the following spring, probably in March. For corn or other crops planted in the late spring, application could be started in the late fall or winter prior to the planting season. In the spring, application could be made before the land is plowed or can be applied in the seed bed anytime between plowing and planting.

Applicator for applying agricultural ammonia mounted on trailer.

Equipment Needed

Equipment needed by a company going into this business includes storage tanks and a tank truck. Because of the peak demand during late summer, fall and winter months, storage capacity should be nearly sufficient to hold an annual supply. A tank truck is a necessity for transfering to the storage tank and for supplying farmers and dealers. An applicator might also be included for loan or rental to customers and, if

required, for the company to do its own applying and experimenting.

In this connection, it should be fully understood that in the handling of anhydrous ammonia there are certain hazards of burning and exploding, against which precautions must be taken, with which all applicators must be familiar. Certain specifications governing safety also must be followed for storage tanks and tank trucks, which should be available from the ammonia manufacturer and equipment manufacturer.

Ammonia Application Details

Field and row-type cultivators are both adaptable to anhydrous ammonia injection with the supply tank mounted on the tractor or implement frame. Also special tractor drawn anhydrous ammonia machines have been developed for both row crop and broadcast type applications.

Positive displacement pumps or other controls meter the ammonia to small metal pipes attached to the trailing edges of sword shaped blades or applicators. These are lowered into the ground as the tractor moves down the field. The applicators are set to discharge the ammonia at the desired depth and the pump, which is driven from the ground wheel, is set to apply the nitrogen at the desired amount per acre.

With a hundred gallon tank and a four row implement one man can apply anhydrous ammonia to from 25 to 50 acres a day at a rate of 40 pounds of nitrogen per acre. This is about twice the acreage two men can cover when applied in solid fertilizer.

Ice Service Advertised In Newspaper Supplement

AN elaborate eight page brochure, printed magazine style as a special supplement to the St. Louis Globe Democrat May 24, 1953, advertising its ice and fuel products has been issued by City Products Corp. of St. Louis.

A striking headline, "Ice at your finger tips, 24-Hour Service", is displayed on the front cover which also features a picture in color of one of City Product's vending stations selling block ice and cubes.

On page two appears an interesting historical sketch of the company founded around the middle of the last century by Christopher Muckerman. Management later passed to his son, I. C. Muckerman, who was general manager of the company during its greatest expansion. And now Richard C. Muckerman is carrying on the tradition of progress established by his grandfather. A picture of an ice station early in the century is contrasted with a typical drive-in ice vending station of today.

A map, on page 3 valuable to St. Louis residents, locates City Products drive-in ice stations, open day and night, in all sections of the city, also suburbs and across the river in Illinois. Pages 4 and 5 presents a center spread of pictures showing how ice is manufactured. Fuel oil and coal are advertised on pages 6 and 7 and page 8 contains information on ice cube service.

Ice Exhibits Draw Interested Crowds at Restaurant Convention

AN ice exhibit at the Washington State Restaurant Convention in Seattle attracted much favorable attention. It was presented by The Rainier Ice & Coal Storage Company in cooperation with the Northwest Association of Ice Industries.

For the second day there was a large ice-carved swan mounted on the same block and a vase about 20 inches high mounted on a base about three feet long by 20 inches wide. The display salad case also was shown, with a change of salads.

Third day exhibit of Rainier Ice Company and Northwest Association of Ice Industries at Washington State Restaurant Convention. The large ice letters were carved from red-colored ice.

The first day there was a large N W A I I carved out of ice in letters about 16 inches high placed on a base of ice made from full ice cake thickness about 60 inches long and 30 inches wide. In this base were 25 colored electric lights connected with individual flashers that went on and off in an ever changing color combination.

This display was at the back of the booth and at the front was a pyramid base of ice about 3½ feet wide at the base and about two feet high, tapering to about 18 inches wide at the top. On this base was a punch bowl made of ice and this in turn was capped by an arch of ice, making the top of the display about five feet from the floor. In the punch bowl was an assortment of fruit. On the left was a salad display case filled with sparkling sized ice on which was placed prepared salads.

For the third day there was a large ICE colored red. In front there was an ice punch bowl filled with sparkling, crystal clear sized ice. Another punch bowl on a smaller base was filled with red colored water to represent punch. The display salad case also was repeated.

For each of these displays about 1500 pounds of ice was used. The booth attracted more than its share of attention and there were so many people milling about that there was little chances of doing effective selling.

L. F. Marsh, who was kept busy making up these sets, says that ice men who are not doing anything along the line of such displays may be missing a bet. Carving things from ice, he continues, is not as difficult as most people think. All it takes is a little practice, time and patience and a willingness to try.

The Ice Industry

Gulf Ice Men Meet

THE spring meeting of The Gulf Coast Ice Association was held in the Pensacola Country Club on April 16, 1953. President J. W. Nipper presided at the two business sessions held in the morning and afternoon.

Industry problems in the manufacturing, delivery and merchandising fields were covered at both sessions by excellent speakers, all experts on their subjects, from Alabama, Georgia and Florida.

Election of officers and directors for the year 1953-54 was the first order of business at the afternoon session and the following men were named:

President, James L. Reed, Selma, Ala.

Vice-President, L. A. Matrone, Pensacola, Fla.

Treasurer, Pete Weed, Panama City, Fla.

Secretary, Mrs. J. L. Reed, Selma, Ala.

Board of Directors: Max K. Lawrenze, Jr., Gulf Shores, Ala; L. E. Johnson, Marianna, Fla.; J. W. Nipper, Pensacola, Fla.; T. A. Broughton, Andalusia, Ala.

Canadian Conference On Meat on Ice

ICE dealers from many parts of Ontario sat in on the practical demonstrations and discussions of "Meat-On-Ice merchandising staged at Kitchener, Ontario, on May 6. John McGoey of the Ranger Ice Company, who has had an enviable experience in the commercial ice field, outlined for the delegates the history of meat-on-ice. Mr. McGoey displayed and commented on the recent National Association of Ice Industries portfolio "The Ice Way to More Profit from Your Meat Department." But, he cautioned, valuable as this material is, its study must be accompanied by personal selling.

At this meeting a refrigerated meat case was on display and various phases of its operation and service were taken up point by point. Among the many food store operators taking part in the demonstration were Peter Ernst of Zahr's Marketeria, Kitchener, which operates meat-on-ice and pre-packaged meat counter stated that the meat is brighter with less drying out and wastage is practically eliminated. Mr. Hodgkinson, Waterloo, proprietor of an independent grocery and meat store stated customers mentioned improvement in flavor of meat, and he is well satisfied with combination of ice and mechanical refrigeration. Mr. Yule, meatmarket operator of Toronto, has used ice in a mechanical counter for about a year, and said that hamburger and sausage left in case over the week-end are saleable on Monday.

The keen interest shown by ice dealers at this conference, and the good success achieved by many ice dealers in meat-on-ice, should be an inspiration to all ice men to develop the new ice business possible in this modern method of meat merchandising.

Veteran Florida Ice Man is Honored

A SOLID gold lapel pin was awarded to H. W. Stewart, public relations official with the Consumers Ice Company in Jacksonville, Fla. at the company's annual banquet November 19, 1952. The presentation was made before one hundred employees, their wives and friends.

The pin, awarded in recognition and appreciation of Mr. Stewart's loyalty and contributions to the industry, has a large number 50 in the center with the inscription—"Faithful Service to the Ice Industry" encircling it.

Active at the age of 77 this gracious gentleman has been in the ice business in Jacksonville continuously since April 1902. He started to work with his father in New Orleans, La. in 1887. Freeman Stewart, his father was a pioneer in refrigeration engineering and helped build one of the first ice machines at the Columbus Iron Works in Columbus, Georgia in 1883 for H. D. Stratton.

Mr. Stewart came to Jacksonville in 1902 and, with his brother Charles T. Stewart, helped construct the three hundred ton Florida Ice Manufacturing plant (now owned by Atlantic Co.) and located at Myrtle Ave. and Dennis St. In a reminiscent mood the veteran ice man recalled that the Vilter system of ice manufacturing was used at first in this plant. Two 9000 pound blocks of ice were frozen on two large steel sheets in the course of seven days at a temperature of 31F.

He also recalled a plant in New Orleans that manufactured 20 pound blocks of ice and, left your reporter wide-eyed with amazement when he told of a Mr. Beath in New Orleans about the year 1900 who took six months to freeze a solid block of ice SO large that approximately 50 tons of ice was sawed and sold from it each day for the remaining six months. Imagine one block of ice that weighed about 9000 tons!

(The Mr. Beath referred to was John M. Beath, one of the early American inventors of ice making machinery. His early ice plants were operated by compression machines and ice was made by the plate method.)

In 1911 Mr. Stewart became a part owner of the Florida Ice & Coal Company in Jacksonville, Fla. The first ice produced in this 125 ton plant was sold to J. K. David who still operates the Duval Ice & Coal Company in Jacksonville Fla. The Florida Ice & Coal Company operated under this name for twenty years and then it became known as Chapin-Sack's. Mr. Stewart remained and later it became a part of the properties owned by I. W. Ross, father of Mrs. Mollie Heath.

Consumers Ice Company finally bought most of Mr. Worth's properties in Jacksonville and for the past nine years Mr. Stewart has been associated with this company.

Veteran ice man, H. W. Stewart, receives solid gold lapel pin after fifty years service with Consumers Ice Company from T. E. Epps, manager, while G. S. Barbee, vice-president, looks on.

Refrigerated Warehousing Industry

NATIONAL ASSOCIATION of REFRIGERATED WAREHOUSES

Division of American Warehousemen's Association

Executive Offices
TOWER BUILDING, WASHINGTON 5, D.C.
Executive Vice-president
WM. DALTON, WASHINGTON, D.C.
Secretary
JOS. H. COLQUITT, WASHINGTON, D.C.
President
R. M. CONNER, CHICAGO, ILL.
Vice-president
MILLARD YOUNG, SAN FRANCISCO, CALIF.
Treasurer
WAYNE WILSON, BROOKLYN, N. Y.

THIS MONTH IN BRIEF

The thirty - first annual convention of the Pacific States Cold Storage Warehousemen's Association was held April 22. Among the subjects covered were storage of fruits and vegetables, plant safety, legal liability, standardized pallets, and revision of safety orders.

The annual report of the Refrigeration Research Foundation by Director H. C. Diehl shows a wealth of technical information developed from practical research. Approximately twenty major research projects, in addition to short term studies were carried on during 1953.

A new warehouse on "stilts", to raise it above flood level has been completed by The Midwest Cold Storage & Ice Corp., Kansas City, Kans.

Several important changes in bonding requirements have been announced by M. J. Hudtloff, director P & MA Transportation and Warehousing Branch, Dept. of Agriculture.

Pacific States Cold Storage Warehousemen's Association Holds 31st Annual Convention

THE Pacific States Cold Storage Warehousemen's Association met in its 31st annual convention at the Hotel del Coronado, Coronado, Calif., April 22, 1953, President Millard W. Young presiding.

Technical Aspects

The technical aspects of the refrigerated warehousing business were discussed by speakers who are outstanding experts in their fields. They were Professor F. W. Allen of the College of Agriculture, University of California, Davis; and A. Lloyd Ryall of the United States Department of Agriculture, Fresno.

Professor Allen reviewed some of the projects carried on by Dr. Claypool and himself in pomology and described the activities of several other departments of the University.

Mr. Ryall covered the storage of fruits and vegetables. By the use of colored slides he showed the effects of certain diseases of fruits and vegetables which would enable warehousemen to determine quality and holding characteristics of such commodities when presented for storage. He described how the fruits and vegetables became infected by various diseases and discussed the holding qualities of such infected goods.

Plant Safety

A plant safety program was presented by A. R. Carstensen who through colored moving pictures clearly demonstrated the importance an intelligently-planned safety program can have in building employee morale, increasing efficiency of operations and reducing lost time due to accidents.

Mr. Carstensen showed in the case of his own operation that "Save with Safety" are not idle words but a definite objective which can be obtained through proper planning, education of employees and close supervision by management. He also pointed out that it is not enough for management to establish a good safety program but that in order for this program to pay off it requires the continuous and careful supervision of those responsible for its creation. The slogan "Save With Safety" should ever be in the minds of top management as well as employees.

Legal Liability

E. Pym Jones, San Francisco insurance broker, presented an address concerning the importance of warehousemen's legal liability insurance. He pointed out that under the provisions of the Warehouse Receipts Act "a warehouseman shall be responsible for any loss or injury to the goods caused by his failure to exercise such care in regard to them as a reasonably careful owner of similar goods would exercise . . ." Mr. Jones stressed the contingent liability under this basic warehouse law by citing specific cases involving loss of goods held in storage which resulted in suits being brought by storers and the insurance companies, claiming such losses occurred through acts of negligence on the part of the warehousemen.

He pointed out the advantages of warehousemen protecting themselves against loss and damage suits of this nature through warehousemen's legal liability insurance. Under a group policy he stated that each warehouse carried only the limits of insurance and deductible that it deemed necessary for its own protection and that the rates for each individual company were predicated upon the factors surrounding each warehouse. He stated, however, that the premiums were some 20 percent less under the group policy.

Following Mr. Jones' review it was the consensus of those present that a questionnaire should be prepared by the Association for transmittal to

the membership, asking for pertinent information which would enable Mr. Jones to ascertain whether group policies, such as mentioned above, would be in the interest of the membership.

Standardized Pallets

Standardization of pallets and pallet interchange was discussed to determine what steps the industry can take toward the intelligent study of this subject which is growing in importance in proportion to the ever-rising costs of distributing and merchandising goods of all descriptions.

A. W. Merrifield, a director of the California Motor Truck Association in a letter to a member of the industry called attention to the importance of this subject when he stated, "It is my feeling that this is a very opportune moment to bring pallet standardization to the minds of warehousemen and shippers, as through the proper handling of merchandise and the proper utilization of pallets, costs of handling can be reduced materially."

It was the feeling of those present that the Association should be able to contribute basic information concerning this matter, such as the number of pallets used by each individual warehouse, broken down by sizes; also, information should be available to members of the industry and others as to the code number which appears on the individual company's pallets. This latter information will enable the return to their rightful owners of many pallets which have found their way into the hands of other warehousemen.

It was also the feeling that this information should be published by the Association so that members can keep abreast of the trend in changes of pallet sizes and assist in the overall palletization program by furnishing factual data to others.

Revision of Safety Orders

The attention of the industry was called to the fact that the Department of Industrial Relations, Division of Industrial Safety, of the State of California, has issued certain proposed revisions of the General Industry Safety Orders now in effect. These revisions clearly affect the cold storage industry and under the present proposals could be extremely costly through modifications that would have to be made in refrigeration equipment and plant structure.

Resolutions

Resolutions were presented and adopted expressing opposition to the existing California Inventory Tax; recommending formation of a Sports and Recreation Committee by the Association; and thanking the speakers and officers of the association for their contributions to the program.

Officers

The following officers were elected for the coming year:

President, A. R. Carstensen, Sacramento.

Vice-presidents: John B. Beard, Modesto; G. F. Dodson, San Jose; Wm. Giacomazzi, San Jose; L. J. Urban, Los Angeles.

Treasurer, Harold G. Hacke, San Francisco.

Executive Manager, Jack L. Dawson, San Francisco.

Directors: L. A. Arata, San Francisco; Paul Ashley, Fresno; Wm. Giacomazzi, Jr., San Jose; Hyland Hinman, Oakland; H. J. Nissen, Los Angeles; V. V. Ogburn, San Francisco; M. H. Schinnerer, Long Beach; J. G. Snow, Los Angeles; L. J. Urban, Los Angeles; M. W. Young, San Francisco.

Operators Learn New Techniques at Conferences

TO KEEP pace with rapidly changing conditions in the perishable food industry, refrigerated warehouses across the nation are sending their operating personnel back to school, according to William Dalton, executive vice president of the National Association of Refrigerated Warehouses.

Regional training conferences, jointly sponsored by NARW and H. C. Diehl, director of The Refrigeration Research Foundation, have been established. "The prime purpose of the training sessions is to acquaint warehousemen with new operating techniques to enable them to adapt their facilities to meet every changing condition, assuring their customers of the best services possible", Dalton said.

"Emphasis is placed on problems that are new and pressing in this present era of expanding volume of frozen foods and other refrigerated products — problems such as rising costs of labor and equipment, materials handling and construction, and the increasing special attention being required for new and establish frozen foods and other commodities", he said.

Two sessions, each lasting four days, have already been held—one in St. Louis, Mo., in February and another in San Jose, Calif., in March. A third training conference was held at Baltimore, Md., April 12-16.

At the San Jose Conference, which was attended by 75 warehousemen, the subjects were mechanical handling, refrigeration and humidity control, safety, warehousing costs, sanitation and good housekeeping, customer relations, employee relations. Discussion leaders selected for these conferences represented a cross-section of industry leaders with extensive research and industrial experiences.

Group of students at one of the warehouse training conferences.

After general sessions, trainees are divided into three groups so that effective consideration of individual problems can be attained. In addition this gives the trainees the opportunity to review the subject as presented in the general session.

Expenses of the conference was met by fees paid for registration and attendance by representatives of the various refrigerated warehouses. Arrangements in the hotel included a large meeting place for general sessions and smaller rooms for the discussion periods. A get-acquainted reception was held the evening prior to each conference sponsored by local chapters of NARW.

Annual Report of
Refrigeration Research Foundation

H. C. DIEHL, DIRECTOR

AS IN the past, the Foundation maintained an active part in approximately 20 major research projects in various agencies and institutions over the country during the year 1952. These are part of the onward march of science toward better health and well being of the public, through improved application of refrigeration in the preservation of foods.

Freezing Milk

The project on freezing of milk, aided by the Foundation at the University of Minnesota, offers an example of useful research. Members of the Foundation and of the National Association of Refrigerated Warehouses who attended the Annual Meeting in New Orleans in May, 1952, had a remarkable opportunity to hear, in terms wholly understandable to the layman, an explanation of the scientist's techniques, and their results and significance, made by Dr. S. T. Coulter, leader of the project. The opportunities that lie in frozen milk and milk products are very large, but many economic, industrial, and technical problems must be solved before widespread distribution for civilian use can ensue.

The large potential values of frozen milk are still unrealized but they are less distant than they were earlier, and many research and industrial organizations are aiding progress in their direction.

Gulf Shrimp

Because of its importance and pioneering nature, the project dealing with Gulf shrimp at Louisiana State University under Dr. E. A. Fieger has remained on the Foundation roster almost from the beginning. This project has taught us much of what we know about causes of deterioration in shrimp and the routines and time periods of those changes. Lately, Dr. Fieger has defined the conditions that favor the development of the trouble known as black spot and his researches have removed much of the cloud of ignorance that has surrounded the cause of the trouble.

Many other research agencies are working on problems of the fisheries. The project under Dr. Fieger and the project dealing with crab meat, jointly conducted by U. S. Fish and Wildlife Service and University of Maryland, as well as the Foundation's counseling with National Fisheries Institute have all enabled the refrigerated warehousing to contribute additional power to the progress of the fisheries industries.

Nuts and Candies

The fact that industrial progress is heavily dependent on carefully managed, broad-gauged major research projects is well illustrated by the work of Dr. J. G. Woodroof at Georgia Agricultural Experiment Station. The projects there on refrigerated storage of nuts and candies, aided also by National Confectioners Association and individual processors and handlers of these products, have been effective industry builders because they have constituted a focal point where sound new technical facts can be learned, for direct industrial application.

Our investigations in these fields have reached a point of advancement that requires change, and thus other important research projects have emanated from the original studies. One deals with the control and avoidance of sugar bloom on chocolate candies, as caused by condensation. It will be pursued in 1953 at the Georgia Station, jointly aided by the Foundation and the National Confectioners Association. Another investigation stimulated by the earlier researches deals presently with the effects of condensation on the components of C rations for the Armed Forces and on container performance when refrigerated storage is employed for primary stockpiling.

Further, the problem of avoidance of dewpoint and condensation, especially on products themselves when packed in commercial containers and shipping cases, and particularly on removal from cool or freezing environment, is now the subject of a very comprehensive study. An ever increasing number of cold-stored commodities, such as candies, canned foods, and storage batteries, are subject to container-moistening and related problems, and for this reason the new undertaking is an urgent task for the Foundation and our collaborators.

Air Purification

Many Foundation members have heard Prof. C. E. Baker discuss the extensive investigations of storage-atmosphere control, air purification, and air conditioning of which he is in charge at Purdue University. From the later phases of these long-term well equipped investigations we have obtained improved knowledge of the usefulness of activated-carbon air filters in storages, new knowledge of Rome spot and its control, and a better understanding of the behaviour of mixed commodities in refrigerated storage.

Citrus Fruits

The very extensive project on storage of citrus fruits (Florida oranges, Florida and Texas grapefruits, and California lemons) can be cited again as an example of a study that ranges over a wide territory, involves many people, and yields valuable results over a period of many years. We may feel confident, as Dr. Paul Harding of Orlando, Florida, has pointed out, that the public will continue to demand citrus in various forms, including fresh fruit. The frozen-concentrate industry has caused increased production of citrus, and fresh shipments have maintained a strong position while frozen concentrated juice has made very large growth.

An interesting example of usefulness of new technical facts that was not discerned initially is revealed here. Some of the processors of citrus juices and concentrates have become interested in these storage results, because they offer opportunity for a longer processing season for their plants. For this purpose, skin blemishes, which are a difficult problem in citrus storage at temperatures near 32 F., if the fruit is to be sold fresh, are not an important factor. Hence it may be possible to store fruit for processing at lower temperature, with better retention of juice quality and greater reduction in hazard of decay.

As a result of the citrus project, summer storage has been carried out commercially with Florida Valencias, but further work must be done with grapefruit. Studies have continued on lemon storage, as used in terminal markets, and the information is proving useful.

Some information has come from the temperature-tolerance studies but additional time must elapse before general publication of results can be attempted. Information on the effects of high and low scalding temperatures on frozen turkeys has become available during the past year.

Industrial Cooperation

The subject of industrial participation in technological progress is so important as to deserve a special treatise. It could be developed in the direction of specific projects, for this subject bears directly on projects. It deserves special attention for its bearing on training of operatives and development of technological inquisitiveness and improved skills. Another profitable avenue of development would be that of the gradual reduction of imperfect understanding between industry and research. Still another matter of related importance is public relations; the public is keenly interested in advancements that secure its welfare and that of posterity.

As Foundation members know, L. M. Ashenbrenner of Toledo suggested that lead-acid batteries might be worthy of special study because they were being cold-stored on a small scale and the assembly of sound information, possibly additional investigation, and certainly comprehensive scrutiny of all available information would probably promote use of cold storage for batteries on a larger scale. Here again the economic advantage is great, since loss of charge in stockpiled batteries is costly, and stockpiling is necessary if manufacture is to continue uninterrupted.

To Mr. Ashenbrenner's suggestion the Director responded immediately and as a result enough information was collected for a section in the Commodity Storage Manual, which was prepared and distributed to members.

Industry cooperation is involved in the Foundation's studies of fluorescent lighting. Through the National Association of Refrigerated Warehouses John Jacobson of Worcester, Mass., called attention to his successful experience in freezing baked goods. Here once more we have an example of reduction of peak labor requirement through use of refrigeration. Bakery products can be produced on normal working schedules and stored for periods of large use, without loss in quality, if they are held at freezing temperature. The Director has established a working relationship with baking-industry leaders and it is hoped that this promising subject can be developed further.

From Armour & Co. the Foundation has obtained valuable information on use of the new product Cunilates in paints to reduce and control surface molds, and the Director has worked with the manufacturer of this product on tests under warehousing conditions. Millard W. Young of San Francisco has supplied timely information on frozen high-solids tomato paste — a promising new product. Messrs. T. E. Evans, Kenneth Stepleton, and A. R. Current of Chicago, John Bear of Wichita, and others have aided in dissemination of information on the glazing of hams. The purpose here is not, of course, to cover the entire range but rather to exemplify the numerous ways in which industry can and does participate in dissemination of information and study of new developments.

The Science Clinic at the Annual Meeting of the National Association and the Foundation in May, 1952, proved highly successful because it encouraged every one present to enter into discussion of technical progress and application of refrigeration to products that have not been cold stored in the past. The program of regional training conferences planned in 1952 and being carried out in 1953 by the Foundation and the National Association of Refrigerated Warehouses jointly at St. Louis, San Jose, and Baltimore, is a direct stimulus to industry participation in technical matters and the response to this program promises to be excellent.

Short-Term Projects

The Foundation's provisions for Short-Term Investigations, established with a number of colleges, universities, and State experiment stations have continued to be profitable in terms of new knowledge, and they repeatedly offer opportunities for exploratory investigation without delay, and directly to the point of interest.

During the past year a project of this category was established in the office of the Director and it has been put to service in preliminary investigations of the use of fluorescent and mercury-vapor lighting in refrigerated warehouses and in the development of sanitation measures especially applicable to warehouses.

At the Massachusetts Institute of Technology, Dr. B. E. Proctor and associates completed studies of refrigerated storage of spices, in cooperation with the Research Committee of the Spice Trades Association. It appears that loss of color in certain highly pigmented spices, as well as insect and fungus activity, can be controlled through refrigeration. Studies of cooling rates of butter stacked with and without dunnage were conducted by Dr. Paul Tracy at the University of Illinois, and it was shown that dunnage is not required for butter received in condition proper for storage and has no effect on subsequent cooling rate in relation to maintenance of quality.

Contact with current development and future outlook in food irradiation was maintained by Prof. Carl F. Kayan of Columbia University. The Foundation seeks sound knowledge and sound evaluations of all new developments that might affect refrigerated storage in the future. Speculative statements that refrigeration may be made obsolete by eventual development of irradiation seem to be unwarranted by facts obtained in research up to the present.

Many exceedingly interesting new developments in the Gulf shrimp industry have been explored by Dr. E. A. Fieger at Louisiana State University. The formation of an international association of processors in the United States and Mexico has created opportunity for the implementation of technical facts, possibly setting a pattern worthy of consideration by other groups in the rapidly growing fisheries industries.

The accumulation of information on refrigeration of coffees by Prof. C. E. Baker at Purdue University continues and may become very valuable later. Other examples of the usefulness of the Short-Term Investigations could be mentioned, but enough has been said to show their utility in the general program.

Research Councils

Never, in the Annual Reports and various other publications of the Foundation, has quite enough been said about the value to the refrigerated-storage industry of the Scientific Advisory Council. As the years go by, however, the personalities and capabilities of the scientists who participate, and the worth of these contributions, become more familiar to our members. One experience of the past year will be mentioned as evidence of the truth of the statement just made.

At the Annual Meeting of the Scientific Advisory Council in New Orleans in May, 1952 the Council and the Director undertook an informal survey of present status of progress

(Continued on page 48)

May 31 Cold Storage Holdings

ACCORDING to May 31 reports on refrigerated stores received by the U. S. Department of Agriculture, holdings of creamery butter and American cheddar cheese each reached new record highs for the month with 194 and 274 million pounds, respectively, in storage as each commodity was increased by more than 40 million pounds since April 30. Shell egg stocks at 1.5 million cases established a May 31 record low. Frozen fruit stocks were at a new post-war low for May 31 with only 134 million pounds reported in storage. Frozen vegetable stocks, on the other hand, surpassed all previous May 31 amounts with 361 million pounds in store. Orange concentrate stocks totaled 24 million gallons, 3 million less than last year. Poultry stocks fell off twice as much as last year but not as much as average. Pork stocks were more than one-third under last year's stores—460 million versus 728 million pounds. Holdings of beef were reduced by greater than average amounts but stocks still were about 70 percent greater than the May 31, 1948-52 average.

Cooler occupancy on May 31 was up 4 points from the previous month, a gain unequalled since 1943. Although the current occupancy level of 61 percent was 2 points above the 5-year average occupancy for May 31, it was about equal to the level reported last year. The national increase since April 30 was matched by rises in all regions except in the South Atlantic, Mountain, and Pacific where cooler occupancy remained at a very low level or almost unchanged from the previous month. The May 31 freezer occupancy of 68 percent was a drop of 2 points since April 30. This compares with 77 percent reported last year and 68 percent on May 31 during the 5-year period ended 1952.

The May net movement of cooler-held commodities from store amounted to more than 31 million pounds or a net decline of about 3 percent. Stocks of fresh vegetables and meats each reflected seasonal net withdrawals which, collectively, more than countered the 105 million pound net increase in stocks of dried and evaporated fruits, nuts and nut meats, cheese and other dairy products, shell and dried eggs, thereby reducing the May 31 stores in cooler to 1.2 billion pounds. Freezer-stored commodities were 21 million pounds under the previous month's total with 2.1 billion pounds reported on hand by the end of May. This unusually heavy May net reduction was accounted for largely by above average net withdrawals of frozen fruits, vegetables, and meats from store which offset seasonal accumulations of cream, butter, frozen eggs, and frozen juices.

The net change in frozen fruit stocks was a decrease of 17 million pounds which is in contrast to a 6 million pound increase last year and an increase of 5 million pounds during May in the 5-year average period ended 1952. Total stores of frozen fruits were down to 134 million pounds as compared with 198 million last year and 196 million in store May 31 in the 5-year average period. Of all the frozen fruit items, only frozen peaches exceeded both its May 31 5-year average level and holdings

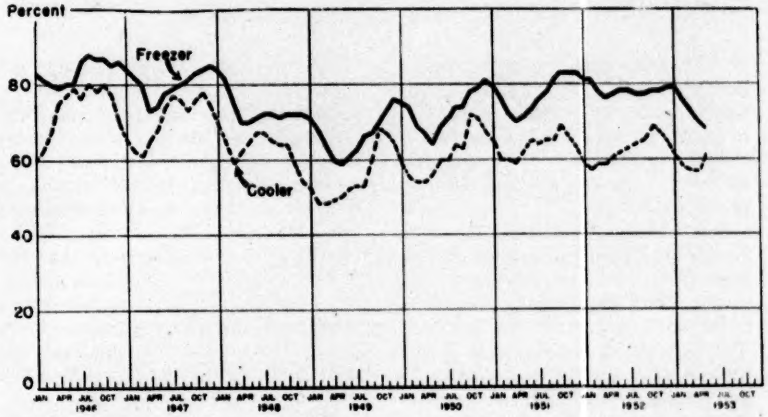


TABLE 1—COLD STORAGE HOLDINGS IN PUBLIC, PRIVATE AND SEMI-PRIVATE WAREHOUSES, APPLE HOUSES AND MEAT PACKING PLANTS (000 LBS.)

	May 1953	April 1953	May 1952	Five Year Average
Beef	194,261	217,500	213,316	113,891
Pork	459,842	538,025	726,665	576,451
Other Meats and Meat Products	163,108	173,157	154,228	123,894
Frozen poultry, lbs.	123,695	140,371	185,688	128,670
Creamery butter, lbs.	193,905	149,876	30,821	55,994
American Cheese, lbs.	273,610	231,524	164,654	148,800
Other cheese, lbs.	21,864	18,672	16,435	17,615
Shell Eggs, cases	1,451	816	3,184	3,105
Frozen eggs, lbs.	131,255	98,978	145,863	175,637
Apples, bu.	1,355	3 278	1,037	1,663
Frozen fruits, lbs.	133,584	150,218	197,755	1995,938
Frozen vegetables, lbs.	360,990	384,285	301,739	228,061
Frozen fish, lbs.	110,577	109,189	123,762	100,906

TABLE 2—PERCENTAGE OF SPACE OCCUPIED BY PUBLIC COLD STORAGE WAREHOUSES (APPLE HOUSES EXCLUDED)

	Net Piling space (000 cu ft)		May 1953 (%)		April 1953 (%)		May 1952 (%)		5 year average (%)	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England	2,935	6,824	48	61	42	61	36	74	44	67
Middle Atlantic	29,537	35,958	52	67	47	66	56	76	52	64
East North Central	27,348	26,215	71	79	68	80	68	83	66	72
West North Central	8,338	18,872	74	79	58	79	72	88	71	81
South Atlantic	8,147	12,649	59	65	60	75	63	80	64	76
East South Central	2,337	3,544	87	81	78	80	60	94	74	88
West South Central	6,967	8,430	72	71	68	73	65	64	66	63
Mountain	1,410	2,987	48	64	56	69	72	79	73	70
Pacific	15,789	29,240	50	55	53	59	54	62	46	55
United States	102,808	144,719	61	68	57	70	61	77	59	68

TABLE 3—PERCENTAGE OF SPACE OCCUPIED BY PRIVATE AND SEMI-PRIVATE REFRIGERATED WAREHOUSES AND MEAT PACKING PLANTS (APPLE HOUSES EXCLUDED)

	Net Piling Space (000 cu ft)		Space Occupied—percent				Net Piling Space (000 cu ft)		Space Occupied—percent			
			May 1953		May 1952				May 1953		May 195	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England	—	—	—	—	—	—	—	—	—	—	—	—
Middle Atlantic	2,149	2,457	58	69	30	56	924	194	91	64	63	78
East North Central	3,300	5,262	65	53	72	63	3,715	764	74	67	86	88
West North Central	360	2,064	63	67	75	69	3,173	1,270	78	80	87	91
South Atlantic	97	7,423	69	61	12	61	413	124	96	100	81	100
East South Central	—	—	—	—	—	—	67	74	100	100	100	85
West South Central	—	—	—	—	89	92	294	44	100	100	100	100
Mountain	—	—	—	—	—	—	326	260	100	100	86	100
Pacific	1,432	5,566	46	29	18	36	662	134	93	92	88	91
United States	7,338	22,772	59	64	43	59	9,574	2,864	81	80	85	91

NOTE: Blank spaces indicate that insufficient returns were received.

of a year ago while stocks of Young, Logan, Boysen and similar berries was the only other fruit item to be in excess of last year. The increase in strawberry holdings of less than 3 million pounds was one of the smallest on record.

A record May net disappearance of 23 million pounds reduced frozen vegetable stores to 361 million pounds, but total stocks were still about one-fifth greater than last year. May 31 stores of broccoli were almost three-fourths greater than a year ago, but cauliflower, pumpkin and squash stocks were more than twice the 1952 stores. About one-third more spinach was reported in store this May 31 than a year ago while stocks of brussels sprouts were down about one-fourth from the 1952 level. Also below the 1952 level were holdings of lima beans (5 percent) and snap beans (4 percent) but stocks of asparagus and corn each amounted to about 4 percent more than May 31, 1952 stores. A decrease of 13 million pounds in stocks of frozen peas brought May 31 stores to a little more than 61 million pounds which was about 6 percent under the 1952 stocks.

The net increase reported in butter holdings, 44 million pounds, was the second largest May increase in history, surpassed only in 1943 when the May increase was 53 million pounds. Total butter holdings on May 31 amounted to almost 194 million pounds, the highest on record for this time of year and only 45 million pounds under the all-time record high reached on August 31, 1950.

American cheddar cheese stores also reached an all-time record high for May 31, with 274 million pounds reported in store, a gain of 42 million pounds since April 30. Current stocks were more than 47 percent greater than on May 31, 1950, from which date American cheddar cheese holdings went on to reach more than 292 million pounds by September 30 which still stands as an all-time record high.

Less than average accumulations of shell eggs during May brought total stores to almost 1.5 million cases. A less than average change also prevailed in poultry stocks. The May net disappearance of 17 million pounds was more than one-fifth under the May average but was almost twice the net withdrawal last year. Total stocks amounted to 124 million pounds or about one-third less than the May 31, 1952 stores. Turkey stocks at 59 million pounds reflected a May decrease of 13 million pounds but were still 8 million pounds above average for May 31. Frozen egg stocks totalled 131 million pounds but the May increase was not as great as last year nor as great as average.

Holdings of beef on May 31, 194 million pounds, while about 70 percent greater than average were about 10 percent under last year's stocks. The May net withdrawal was slightly under that of 1952 but was greater than the 5-year average net withdrawal. Pork stocks also reflected a greater than average net withdrawal during May and a net disappearance less than that of last year. Total holdings of pork were down to 460 million pounds which compares with 728 million last year.

May 31 holdings of fishery products totalled 131 million pounds, of which 111 million were frozen fish and shellfish. Last year frozen fishery products equalled more than 123 million pounds while total fish in store on May 31, 1952 amounted to 143 million pounds.

Storage Outlook

The occupancy increases in cooler space reported since March 31 is expected to continue and by the end of June the level reported should be about 63 percent or a gain of 2 points over the May 31 occupancy. This change would be in accord with the 5-year average pattern but would be greater than the May to June increase reported last year. With large quantities of cheese already moving into storage and with any appreciable net into-storage movement of shell eggs, cooler occupancy may increase by as much as 3 points which was the case in 1950 and 1951. Freezer occupancy of 68 percent on May 31 was probably the seasonal low. The upward cycle which should now begin is expected to bring the June 30 occupancy up by as much as 2 points.

Frozen Foods Company Purchases Ice Plant

SALE by Rochester Ice Inc., Rochester, N. Y., of its two-story building at 55 Canterbury Rd. to Seneca Frosted Foods Inc. for $45,000 cash has been announced. Rochester Ice, headed by William J. Lewis Jr., had its main offices at the Canterbury Rd. address, where it formerly had an ice plant. It is moving its offices to its plant at 17 Moore St.

Seneca Frosted Foods Inc. of which Herbert K. Liebich of Albany, N. Y., is president, is moving to Rochester from Brockport, N. Y. Its parent corporation, which operates several frozen foods plants and distributing units, had headquarters in Albany.

Study Predicts Increase In Freezer Space

A STUDY has been announced by ADTA projecting future requirements for freezer space in public refrigerated warehouses through December 1955. The study concludes that the requirements of public "freezer" storage by the end of 1955 will amount to 259 million gross cubic feet, or a continuing expansion of approximately 12 million cubic feet per year. If storage space continues to be added at the present rate of increase, the required 259 million cubic feet will be available.

Use of Antioxidants for Frozen Storage of Turkeys

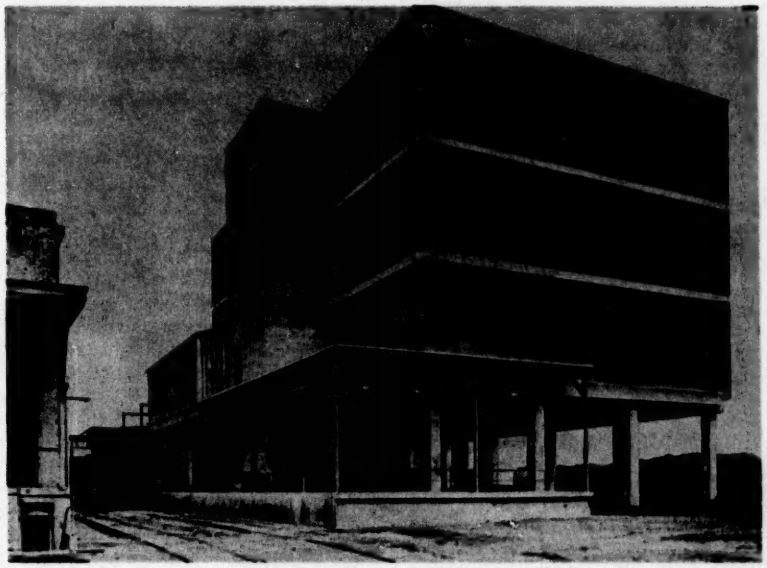
A MARKED reduction in rancidification of the skin and cut meat surface of turkeys in frozen storage was demonstrated by use of an aqueous gelatin coating containing antioxidants says a recent report by the Western Regional Research Laboratory. Such a coating may be desirable whenever optimum packaging with plastic film is not economically feasible, or where large surfaces are exposed as in cut-up turkey.

New Refrigerated Warehouse Built on "Stilts" To Raise it Above Flood Waters

A REFRIGERATED warehouse on "stilts," a new idea in industrial architecture, has been completed by Midwest Cold Storage & Ice Corporation at 5th and Kaw in Kansas City, Kansas. The stilts idea was an outgrowth of losses suffered by the company in the disastrous floods in 1951.

Following this flood, officers of Midwest, headed by W. Irving Moss, Jr., designed the new warehouse with a "new look". Constructed of reinforced concrete, the new 200 carload capacity three-story refrigerated warehouse is built on concrete pilings as shown in the accompanying illustration, with the lowest of the three floors 23 feet above ground. All storage rooms are well above any foreseeable flood water levels. Strategically designed with hydraulic elevators and palletized accomodations, numerous features assuring continuous operation in case of floods have been incorporated in the new construction.

Constructed of reinforced concrete and red brick, the new building will store as much as 200 carloads of merchandise. Its vast storage rooms are heavily insulated to hold a temperature of minus 20 F.



New refrigerated warehouse of Midwest Cold Storage & Ice Corporation, built on stiltlike concrete piles, Kansas City, Kans.

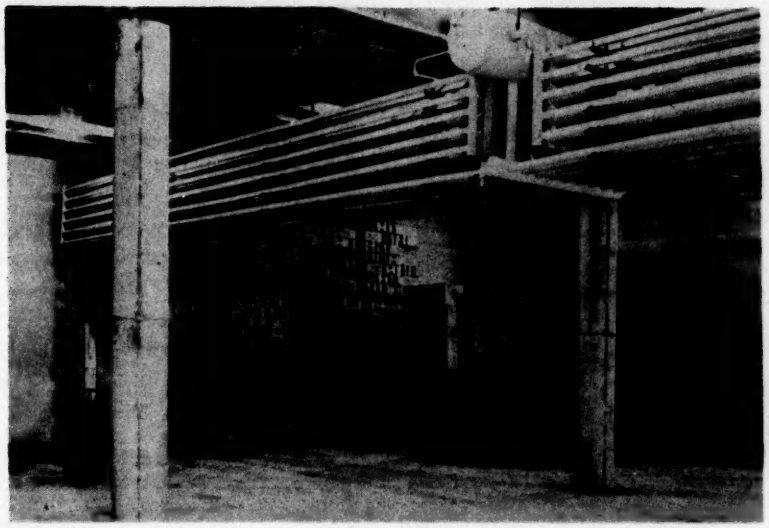
First Floor Above Floods

The lowest of the building's three storage floors is about 23 feet from the ground. Beneath this, on what would ordinarily be the ground floor are ample covered loading docks for both rail and truck transportation. The docks can be enclosed later.

A strategically placed hydraulic elevator opens on one side to the truck loading dock and on the other side to the railway dock. The elevator is large enough to accomodate four palletized stacks of foods at one loading.

The building was designed, to fit the company's specific needs, by Raymond Reese, consulting engineer, of Toledo, Ohio, and was built by William S. Rawlings Co., general contractors.

A prominent feature of its design is the extra width of aisles and doors, which permit completely palletized loading, unloading and storing operations.



A network of pipes carries the refrigerant to keep storage rooms at temperatures as low as minus 20 F. Pelletized stacks of frozen foods are shown in the background.

Speedy Handling

For example, an incoming shipment of frozen foods can be unloaded from a truck onto pallets on a mechanical lift truck. The lift truck, and three like companions, can be loaded into the elevator, driven to the storage rooms, and stacked in place still on pallets, ready for speedy removal by lift truck.

The palletized operations effect a tremendous savings in time and labor required for handling, and have speeded up the operation of storing and withdrawing merchandise.

The Midwest Corporation suffered grave damage, as did most firms in its area, during the 1950 flood. When the rampaging waters of the Kaw cut off all power, the company hauled in dry ice by boat in a successful effort to save perishable items in storage.

(Continued on page 48)

CCC Makes Changes in Bonding Requirements

SEVERAL important changes in bonding requirements have been announced by M. J. Hudtloff, director P & M A Transportation and Warehousing Branch, Department of Agriculture. The changes are as follows:

The amount of the bond required is reduced from 20 to 5 percent of the net book value of the estimated quantity of the commodity to be stored. The minimum bond required is reduced from $10,000 to $5,000, and the maximum from $200,000 to $100,000. Also in establishing the amount of the bond the net worth of the company concerned will be taken into consideration.

Cash or negotiable securities may be accepted by CCC in lieu of the equivalent amount of required bond coverage.

In cases of warehouses operating in a state where the license of that state requires a bond, the state bond may be accepted in lieu of the equivalent amount of bond running directly to CCC, providing the state bond is acceptable to CCC.

Warehousemen's legal liability insurance policies may be accepted in lieu of the equivalent amount of bond coverage, if such policy provides protection equivalent to that provided by the surety bond for which substitution is made and if the policy is acceptable to the Solicitor of CCC.

The bonding requirement will not apply to CCC programs involving the purchase of commodities in storage for prompt shipment or to handling of a temporary nature when such exception is prescribed in PMA instructions.

Mr. Hudtloff also reviewed certain changes in the "Warehousemen's Guidebook" as follows:

The requirement that in freezer storage there be a break of six inches between lots and 18 inches from walls was changed to read "Each lot shall be orderly stacked and separated from other lots by a distinct break (approximately two or three inches). Sufficient clearance must be maintained between the stores commodity and all walls to prevent damage and to provide for proper circulation of air. Main aisles and cross aisles . . . must be provided and maintained.

The requirement that there be a 24 inch aisle between alternate lots of cheese has been eliminated.

The requirement that there be three feet between the top of the stack and the ceiling has been reduced to 18 inches in the case of refrigerated storage.

Paragraph D under Section III (II) of the Guidebook has been changed by eliminating everything after the word "aside" and substituted therefore "and the official samples so separated should be placed in front of the storage lot." This refers to samples of non-fat dry milk solids, cheese and butter.

Jacketed or Double-Walls For Refrigerated Rooms

JACKETED or double-wall rooms are theoretically perfect but presuppose conditions which do not normally exist in practice, according to W. E. Martin, Vancouver Ice & Cold Storage Ltd. Vancouver, B.C. in a recent TRRF Information Bulletin.

All commodities must be at storage room temperature or lower when placed in the room, he says. It is not an uncommon practice in cold storage warehouses during heavy rush periods to freeze or finish the reduction of commodities to storage room temperatures in the rooms themselves, because the cost of having sufficient fast freezing chambers to take care of a peak load would be uneconomical.

Both external and internal walls must be completely vapor sealed. Due to vibration, earth tremors or deterioration, vapor seal needs constant watching to insure that any break is immediately repaired. With a jacketed or double-wall room, it is impossible to detect a break in the vapor seal of the outer wall until that break has reached a dimension requiring a major insulation repair and the temporary removal of the inside wall.

Pipe coil either plain or expanded is not too expensive when one considers its long life, so in the long run, it would appear that the most economical method of maintaining adequate relative humidity in both low and high temperature storage rooms is to insure sufficient properly vapor-proofed insulation, and that sufficient evaporator surface is provided so that the temperature of the evaporator can be kept at a point where the difference between this and the room temperature will hold relative humidity at 90 to 95.

Miss Temple Honored

MISS LUCILLE TEMPLE, administrative assistant, National Association of Refrigerated Warehouses, has been awarded a scholarship to the annual summer school sessions for trade association personnel at Yale University and Northwestern University. Miss Temple will attend the session at Yale in August.

Frozen Foods in England

FROZEN foods are making inroads in the British market. From World Refrigeration comes a report that over the past twelve months or so the British public has become "increasingly attracted to the various quick-frozen foods which are now on the market." One of the chief reasons for this has been a gradual fall in the price which has transformed the quick frozen food or vegetable from a luxury to a more normal purchase. "There is no doubt," the publication points out, "that fresh-frozen foods is here to stay and will rapidly expand the small share of the total of preseved foods which it now holds." —Cold Facts.

Frozen Peas Compared to Fresh Pod Peas

FROZEN and dehydrofrozen peas processed in the laboratory were equal in quality to strictly fresh pod peas, except for small losses of sugar and ascorbic acid according to a report by the Western Regional Research Laboratory. No important chemical changes, other than changes in chlorophyll occurred in pod peas during 18 days' storage at 33 F., but at 75 F. rapid losses of sugar and ascorbic acid occurred. The analysis included total solids, total sugars, reduced ascorbic acid, thiamin, chlorophyll, pH, and color as measured by reflectance.

Frozen Bread On Market

GROCERS throughout the country may soon be selling their bread from deep freezers. Arnold Bakers, Inc. Port Chester, N. Y., is starting to market frozen bread in many areas. The company believes frozen bread will tend to eliminate the problem of stale and left-over bread in the home and will make possible the purchase of bread on a once-a-week basis by the customer. The company, which now distributes its products in 22 states, thinks the problem of freshness will be licked.

Storage Workers End Strike

A WAGE increase strike of cold storage workers ended at Sitka, Alaska May 21. It was reported that the workers accepted the same wages and working conditions that prevailed last year. They are affiliated with the independent International Longshoremen and Warehousemen's Union. The strike had hindered the early season fishing operations.

Practical Refrigerating Engineer

NATIONAL ASSOCIATION PRACTICAL REFRIGERATING ENGINEERS

NEWS
OPERATING
MAINTENANCE
QUESTIONS -- ANSWERS

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THIS MONTH

A study of arctic snow, ice, and frozen ground conditions is being made by scientists working for the United States Army Corps of Engineers. It is a part of the Department of Defense program to conduct year-round research for the armed forces to learn about the properties of these materials in the frigid zone, possible battleground of future wars.

A liquid line frosting nuisance and an operating engineer's decision to disregard manufacturer's instructions, comes to the attention of the Question Box.

Army Engineers Test Snow And Ice For Armed Forces

A SCIENTIFIC war on arctic snow, ice, and frozen ground conditions is being waged by scientists working for the Army's Corps of Engineers in sub-zero laboratories of the Snow, Ice and Permafrost Research Establishment, where temperatures range from plus 33 F to minus 68 F. It is part of the Department of Defense program to conduct year-round research for the Army, Navy, and Air Force to learn about the properties of these common materials in frigid wastelands, possible battlegrounds for future wars.

SIPRE, the Snow, Ice, and Permafrost Research Establishment, is housed in a remodeled, three-story building in Wilmette, Ill., a Chicago suburb. The scientific data will be used to increase the efficiency of military and civilian operations in cold climes. Snow, ice, and frozen ground seasonally cover up to one-third of the earth's land surface. So SIPRE's mission is to find out how men can survive, build roads, houses, and airfields, and fight if necessary, in the far north.

James E. Gillis, Jr., Acting Director, said SIPRE's current emphasis is primarily in the field of research. No immediate practical results can be expected until urgently needed fundamental scientific data have been acquired. Once the characteristics of snow, ice, and frozen ground are known and classified, many problems of arctic warfare, transportation, communications, construction, and living conditions will be either solved or minimized.

Specimens Tested

The heart of SIPRE's labs are six cold rooms, insulated by aluminum-painted cork and cooled by refrigerants that circulate from tanks on the roof. Here specimens of snow and ice are tested, analyzed, and dissected under simulated arctic conditions by scientists and technicians garbed in heavy jackets, gloves, parka hoods, and arctic shoes. Four of the rooms are cooled by calcium chloride and the two coldest ones by trichloroethylene. Temperatures are maintained at plus 33, 23, and 15 F and minus 5, 25, and 68 F.

Dr. Henri Bader measuring the expansion of a sample of polar ice in SIPRE laboratory (U. S. Army Photos)

Briefly, here is how SIPRE's refrigerating system works: Each cold room has a series of coils filled with brine from two 2,500 gallon brine tanks. As air warms the coils, the heat is transferred to the giant tanks on the roof and removed by evaporation of liquid freon, which circulates in coils within the tanks. After the liquid freon is transformed into a gas, two compressors on the first floor condense the gas into a liquid again and pump it back into the brine tanks to remove more heat. The compressors, capable of removing enough heat to melt the equivalent of more than 12 tons of ice per day, are controlled by the temperature of the brine.

Most of the work is done in the plus 23 F lab, where the heat from a man's gloved hand will not melt the

Fig. 1—James Bender, physicist, tests the tensile compression of an ice crystal in cold research laboratory

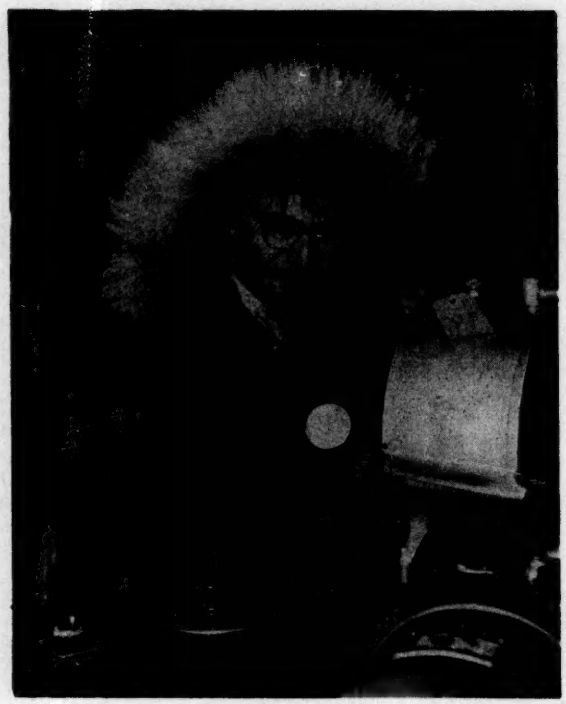


Fig. 2—Dr. Henri Bader, chief scientist at the SIPRE establishment tests the permeability of snow (U. S. Army Photos)

snow and ice. Scientists and technicians use electrically-heated suits when working in the minus 68 F lab with ice crystals from Alaska's Mendenhall glacier and T-3, one of the Air Force's famed floating islands near the North Pole. Ice, according to Dr. Henri Bader, chief scientist and head of the snow and ice basic research branch, can be worked just like a piece of lucite plastic. It can be planed, turned on a lathe, sanded, drilled, and polished on silk to look like a gem.

And just as other building materials are tested, the tensile strength of ice is measured by a SIPRE physicist in Fig. 1. For example a three-inch long, ¾-inch square piece of ice at plus 15 F will withstand 300 pounds of pressure before it crumbles. Another machine (Fig. 2) determines how fast air or gas flows through different kinds of snow. Dr. Bader, world famous scientist, said this experiment provides information that can be very important in case enemy gas bombs are dropped in snow.

Jumbo-sized, 10,000-year-old pure ice crystals from the Mendenhall glacier are used by scientists in ice work. Their size and purity makes them easier to measure and analyze. Arctic ice samples for experimentation are cut with both a hand saw (Fig. 4) and a special electric saw (Fig. 3).

SIPRE, operated by the Army's Corps of Engineers, is staffed with leading scientists and technicians, including physicists, geologists, meterologists, and engineers.

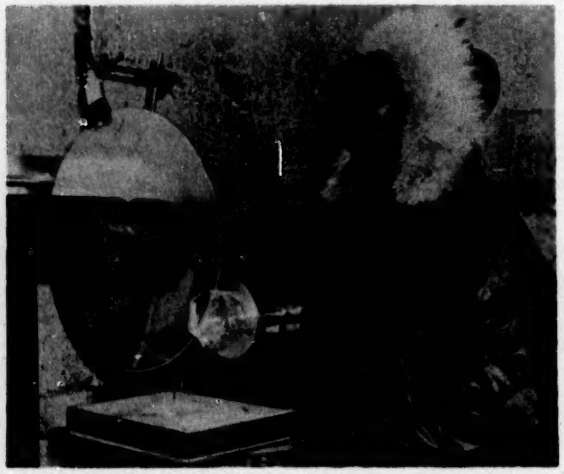


Fig. 3—Glenn Walker, laboratory technician uses gnonometric machine to slice arctic ice

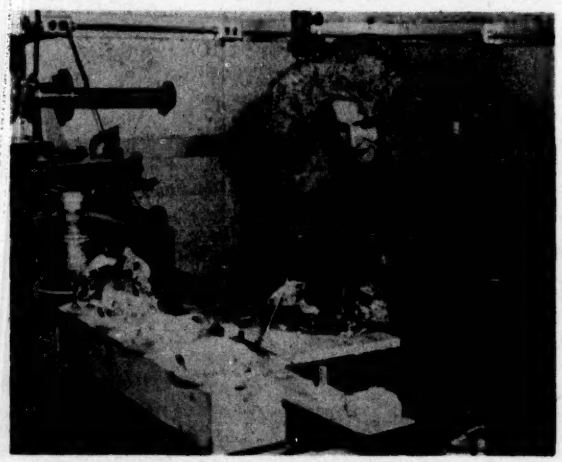


Fig. 4—Theodore Butkovich, physicist, cuts samples of arctic ice for experiments (U. S. Army Photos)

Temperature and Humidity Nuts and Dried Fruits

QUESTION No. 958: I am manager of a canned and packed food distribution warehouse which contains a 20 by 47 by 20 foot high cold storage room storing shelled and non-shelled nuts, and dried fruit. Our operations here are palletized using fork lift trucks through 3 ft. 6 in. by 8 ft. doors. Our plant consists of the following equipment: Model W-1000-FH Tecumseh or Universal compressor driven by a 10 hp motor with an Acme condensing unit all mounted on a Frick frame, serial No. 635007; The system is automatic Freon 12 with three 4½ ton electric defrost Krack coils each with a 4½ ton TD2 Sporlan expansion valve; a Refrigeration Specialties solenoid valve is in the suction line near the compressor. The system was installed in Fall, 1948. The temperature at which the room have been held by this system is from 40 to 45 F.; humidity 70 to 80 percent.

In 1950 and '52 I lost considerable amount of product late in the storage season (Spring) because of mold. I have been told that the mold is due to my relative humidity, and that my temperatures are rather high for these products, too. I have no engineer in this plant and my experience is primarily canned food sales, not cold storage warehousing. Refrigeration contractors with whom I have consulted contradict one another as to the proper solution. What would be your recommendation with regard to temperature, relative humidity and the simplest and least expensive way to achieve those temperatures and humidity?—W.A.F.

ANSWER: "Any temperature below 50 F is satisfactory for the prevention of insect infestation, but in order to retain flavor and minimize the development of staleness, rancidity and mold, the nuts should be well cured and stored at 32 to 36 F., with a relative humidity of 65 to 70 percent. They should not be stored in a room containing any other products (such as fresh or dried fruits, onions, cheese, etc.) from which they will absorb odors or flavors.

"The best storage conditions for dried fruits, including raisins, figs, prunes, apples, pears, peaches and apricots are 32 F and 55 percent relative humidity. Dates should be stored at 28 to 32 F for short periods (a few months) and at lower temperatures for longer periods."—U. S. Dept. of Agriculture Circular No. 278, or 1952 Applications volume, ASRE Data Book.

Since I am not familiar with your refrigeration plant I cannot advise you as to how you can achieve the temperatures and relative humidities recommended by the U. S. Department of Agriculture. I would have to know the following in order to comput the load: Insulation, material, thickness and condition, btu per hour ratings of coils, btu per hour ratings of condensing units, capacity of blowers, condensing water temperature and quantity available, conditions at which coils and condensing units are rated, plant layout, arrangement, pipe sizes, etc., and quantities of each kind of products stored.

Since I cannot advise you on these points, I suggest that you consult with the company that installed your plant, or some company in whom you can place your entire confidence.—H. G. Venemann.

(WAF consulted with the refrigeration contractor who last year installed a most satisfactory air conditioning system for his company offices. This contractor replaced electric motor with a 15 hp unit, modified the drive for more compressor RPM, exchanged condenser for one of larger capacity, and modified the piping system with new solenoid and expansion valves. Room now operates at 32 to 36 F, 65 RH; but for present circumstances require continued storage of packaged dried fruits in this room.—Editor)

N A P R E
Question Box

H. G. Venemann, Professor of Refrigeration, Purdue University and chairman of NAPRE Educational Committee, answers members operating probems monthly in this column. Send questions to Chairman H. G. Venemann c/o Purdue University, West Lafayette, Indiana.

Odor From Dehumidifier

QUESTION No. 959: The office air conditioning plant tends to give off a distinct odor for the first hour every day. It is a central station plant employing a sprayed coil dehumidifier as evaporator. The plant is shut down throughout the night and starts up one hour before the office opens up for the day. The dehumidifier water is changed weekly. There are no local nuisances. With a sprayed coil in the air stream (90% re-circulated) why should there be an odor?—J.O.P.M.

ANSWER: Water, under certain conditions, has a tremendous ability to absorb many gases such as oxygen, carbon dioxide, etc. This ability is increased by lowering the temperature of the water. Hence, while air is being cooled by low temperature of the water, various gases are absorbed by the water. There is a possibility that some of the odorous gases are absorbed to a lesser degree and by recirculation reach an objectionable concentration. When the temperature of the water is increased, the solubility decreases and the gases are released.

N A P R E Department

When a spray type cooler is shut down and allowed to warm up, the unit is filled with a highly concentrated collection of 'what have you' odors that are passed on to the conditioned space in objectionable quantities when the unit is started, and which continue until diluted to an acceptable degree by large quantities of fresh air.

The most popular attempts to correct the nuisance include the use of ultra-violet tubes in the leaving air stream, or the use of aerosols.—W. T. Miller.

Recirculating Condensing Water Over Cooling Towers

QUESTION No. 960: What advantage if any would there be in recirculating the water of an indoor induced draft evaporative condenser (not restricted for air) over a single story roof located gravity type cooling tower assuming optimum atmospheric conditions for such an arrangement of say 110 DB and negligible humidity?—J.O.P.M.

ANSWER: If the induced draft evaporative condenser is properly designed, of adequate size, and in good working order, there would be very little advantage in recirculating its water over another cooling tower. If, however, the evaporative condenser is over-loaded or not functioning properly, its water could be reduced to a lower temperature by recirculating it over a second tower.

A cooling tower when properly designed and loaded should cool the water to within five degrees of the wet bulb temperature, and its efficiency is determined by the following equation:

$$E = \frac{t_2 - t_1}{t_2 - t_3}$$

where t_2 is temperature of water on,
t_1 is temperature of water off,
t_3 is wet bulb temperature of air.

The efficiency of an atmospheric condenser when in operation cannot be determined by this equation because the temperature of the water on and off is always the same. (However, its efficiency as a water cooler when not condensing could be determined by the equation. In this event the water on would have to be heated in some artificial manner in order to conduct a test.) The benefits of a second tower are very little if the first is doing a good job.—H. G. Venemann.

New Questions

By-Passing of Back-Pressure Valves

QUESTION No. 961: When we enlarged our ice plant in the winter of

NAPRE Department

1937 we purchased a new 8 x 8 inch compressor, a water pre-cooler, a flash type ammonia liquid cooler, and two back pressure valves. We were instructed to use the back pressure valves on the ammonia and water coolers, and hook all suction lines together into the other three compressors—one York, 9 x 9 inch at 175 rpm, one York 9 x 9 inch at 237 rpm and one Frick 10 x 10 inch at 300 rpm. I did not follow instructions, but bypassed the back pressure valves, and instead of connecting the coils of the ammonia and water coolers into the same line with all of the compressors, I connected them into the suction line of the 8 x 8 inch compressor and operated them at high back pressure without the use of the back pressure valves. Was I right or wrong?—M.S. J.

Frosting Liquid Line

QUESTION No. 962: I have been working in the refrigeration business for a long time and am now working for Swift & Company, at San Juan, P. R. There is a problem that I would like to ask your cooperation to solve. My problem is the following:

This is a cold storage having seven different temperature rooms operated by two 7 x 7 compressors. The room temperatures are controlled by solenoid valves and thermostatic expansion valves. Temperature in rooms are constantly changing from higher to low, from low to higher, and my great problem is that the liquid line extending from the accumulator to the rooms becomes frosted and when it defrosts, all the inside alley or the anteroom becomes wet. This is what I would like to correct, and would appreciate your cooperation in helping me to solve this.

News Notes and Chapter Activities

St. Louis

KEN HOLADAY

REPORTING for the Nominating Committee at the meeting of April 20, St. Louis, Ken Holaday presented the following list of candidates for the coming year: President, John Dabbs; Vice-President, Ed Lotte; Secretary, Stan Tatalovich; Treasurer, Ed Hughes; Sergeant-at-Arms, Charles Good; Directors, Eugene Kessler and Sherman Merkel. No other candidates were nominated and these presented by the Nominating Committee were accordingly declared elected. Directors E. G. Bishop and J. D. McCarthy continue in office also.

Problems of operation and service of air conditioning equipment were discussed by A. L. Munson, Manager, Air Conditioning Department, Sears and Piou, Distributors of Carrier equipment. Mr. Munson also showed a film "Service Unseen", tracing the development of modern air conditioning equipment and clearly illustrating the engineering principles utilized.

At the final educational session of the season on May 4, instructor John Dabbs presented the subjects on refrigeration instrumentation as outlined in the NAPRE text. He demonstrated the functions of a humidity and temperature recorder. Stan Tatalovich displayed a Pyrocon instrument for convenient measurement of surface temperature throughout a refrigerated system. Harold Suter explained the use of the "Servis Recorder." He showed how it could be used for checking the operation of automotive equipment, the running cycles of a compressor, or any other operation in which vibrations can be sensed by the instrument. Specimens of copper tubing, flaring tools and fittings were demonstrated by Charles Wunderlich and used for connecting a pressure gauge to one of John Dabbs' Freon "Charge-a-Cans." The value of portable instruments and devices for checking plant operations was pointed out. A more complete discussion of application of permanently installed instruments and controls was left for another session.

On May 15, the Chapter met in a private dining room at Town Hall Restaurant for the annual meeting and installation of officers. The meeting marked a departure from precedent, ladies having been invited. All previous meetings of the Chapter, both formal and informal, have been stag affairs. Another highlight of the occasion was the presence of National Secretary and Mrs. Dick Kelahan as special guests. After dinner Mr. Kelahan spoke briefly on the purpose and opportunities of membership, and reminded us that the NAPRE motto is a worthy guide to every-day living.

Retiring President Charles Wunderlich called on Ken Holaday to present the new officers. Each one was congratulated on the honor and responsibilities entrusted to him by the chapter, and charged with faithful performance of the duties prescribed by our constitution. Representing the National Board of Directors, Dick Kelahan led the new officers and the members in repeating the solemn obligation of the organization. After this ceremony the hall was cleared, and the rest of the evening devoted to dancing, conversation and refreshments.

Dallas

HAROLD A. KOUTNIK

ON May 4, Dallas Chapter held its regular meeting in the auditorium of Alford's Refrigerated Warehouse. Elliott R. Hallowell, a national director of NAPRE, conducted an interesting discussion on Heat Calculation for cold storage plants, and desired temperatures in air-conditioning. Following this discussion, the members voted to have a barbecue party on May 18, and then to adjourn until early September.

Chicago

JOHN NEFF

THE Chicago Chapter made the mistake of having too many traveling engineers on the reporting committee and as a result no reports made since March, but lots of new construction hereabouts.

Here's a quick review: At our April 21 meeting, J. T. Rayburn, Chicago sales representative, Dow Chemical Co., served a full meal including cocktails to the members and guests present at the Chicago Engineers Club. After the meal Mr. Rayburn showed a movie on Styrofoam a newer type of insulation developed by the Research Department of Dow Chemical Co. Midland, Michigan. He also had samples of Styrofoam which every one examined as to structural strength, light weight, and non irritating qualities to the respiratory organs or the skin.

The Dow representative then answered all questions put to him to the satisfaction of all present. Representatives from Midland and local applicators were also present. This meeting was one of our best, both from entertainment and educational point of view. Meeting adjourned with a vote of thanks to Mr. Rayburn and The Dow Chemical Co.

On May 5, 1953, after the business session, our instructor, Eugene Rytlewski took over. His subject matter for discussion was pages 209 to 217 of the Guy King course. Many questions were asked from the floor, which Mr. Rytlewski obligingly answered. At the May 19 meeting, A. M. Reilly was appointed chairman of the nominating committee. As this was Old Timer's night, President McKenna asked them to stand. Those who responded were Jay R. Watson, Henry Lahr, A. M. Reilly and John Neff. Mr. Neff is a chapter member of the Chicago Chapter which was organized in 1920. He was the first secretary-treasurer and the late M. N. McDonald was the first president. The meeting was then turned over to W. V. Richards, chairman of the entertainment committee, who served refreshments.

San Francisco

LEWIS BROOKS

AT the regular meeting of California No. 1, Wednesday, May 13, the educational committeemen Henry Guilmette and Howard Boudreau, presented the Foxboro Dewcel Indicating and Recording Equipment, which was set up and in operation during the meeting. Preliminary to the main event, the Pacific Scientific Company exhibited a number of humidity instruments, such as the Friez Hygrodial, sling psychrometer and hand aspirated psychrometers.

Many hungry brothers dined downtown the night of the meeting, getting together for dinner at the Maison-Paul Grill. Congratulations are in order for Andrew N. Hope who married Miss Hazel Lee McAndrews in Reno, Nevada in April. Members heard recently from Ray Winther, retired president of the Ray Winther Company. Ray and his wife Margo have become proprietors of the Packer Lake Lodge near Sierra City, Calif.

Los Angeles

FRED HERR

THE Los Angeles Chapter, NAPRE, on May 20 viewed one of the latest and most impressive refrigeration and air conditioning installations in the city, during a field trip through the machinery rooms of the new Statler Hotel. The trip had been arranged by Chapter President, Frank G. Muzzy, in collaboration with Henry Rising, the hotel's building superintendent. Muzzy introduced the hotel's assistant engineer, Vern Roberts, a member of Los Angeles Chapter, representing Chief Engineer, Maxwell K. Taylor, who was unable to attend because of illness.

The basic figures, as presented in Mr. Roberts' running account to more than 100 members and guests, revealed the Stater hotel to be equipped with refrigeration, air conditioning, water softening and boiler facilities representing a four million slice of the hotel's total cost of twenty five million dollars. The refrigeration capacity is 2220 tons Freon and 110 tons ammonia.

The tour starting at the third basement, led through the compressor room, which includes machinery for serving the vacuum cleaning facilities of the hotel, through the air conditioning room, ice, air washer room, and boiler room. Some inquisitive members peered into the garbage disposal room and gravely inspected two huge dehydrators which dry the wet garbage and pulverize it into powdered fertilizer. One Figure Filbert elicited the notable statistic that the hotel dehyrates 1500 gallons of garbage every 24 hours.

The air conditioning room is equipped with three Carrier Centrifugal Freon machines. Two of these are 900 hp motor driven units of 800 tons refrigeration capacity each; and one a 700 hp turbine driven, 600 ton unit. All but one are equipped with Ideal motors and switch gears. There are also three brine pumps, three 15-degree coolers, and one minus 15 cooler, the latter serving the hotel's skating rink. The north half of this room is equipped for producing 59 blocks of ice per day for supplying the hotel's natural ice needs, such as cube, cracked, chipped and/or shaved ice, for the various cocktail bars, dining rooms and room service departments. A Uline ice cubing machine is installed.

At the West end of the air conditioning machinery room is the boiler room. The Statler's boiler facilities consist of three Babcock & Wilcox, 500 hp boilers, equipped with Republic controls and hooked up for either oil or gas fuel. Loren Timmens, operating engineer, pointed out to the ICE AND REFRIGERATION representatives other major machinery units installed in the boiler room: Two York air compressors that serve the laundry machines; three (120,000 gal. each) water softeners; two Worthington steam-driven fuel pumps; two Union vacuum pumps for condensation return from the laundry and heating systems; one General Electric 400 g.p.m. house pump and one steam turbine driven, 400 g.p.m. house pump for the drinking water, bathroom and miscellaneuos room water systems.

The trip was one of the most interesting and educational which Los Angeles Chapter has sponsored, holding particular interest in that the Statler installations are the newest and most modern in Southern California. Among the visitors who made the trip was J. J. Budge, general manager of James Budge Pty., Ltd., refrigeration engineering firm of Sydney, Australia. Mr. Budge expressed pleasure at meeting the two national officers of NAPRE, Regis Gubser, Second Vice-president, and W. R. Burnett, Sergeant-at-Arms, during his Los Angeles stay.

New Orleans

LEO VIVIEN

THE members of Louisiana Chapter No. 2 were treated to a two-day camp-out on beautiful Lake Ponchartrain by Al Lusch of the Reilly-Benton Co. Delicious meatballs and spaghetti, cooked by Jerry Vieagas, boiled crabs, shrimp, crayfish, cold cuts and all the refreshments wanted were on hand. Facilities were available for fishing, swimming, card games, music and of course the main amusement, bull sessions.

At the regular Chapter meeting, May 13, in the Roosevelt Hotel, Frank Graham, Engineer, York Co., delivered a lecture on centrifugal air conditioning systems and their application. The subject as outlined by Mr. Graham was very instructive. Numerous questions caused the speaker to hold the floor for one and one-half hours.

A recent member of our Chapter, L. Charles Cressy, manager of the Air Filter Co., invited the Chapter to participate in a visit to their new plant Saturday, May 23. The Air Filter Co. specializes in washing and charging filters of all types, endeavoring to render real service to engineers who operate this type of equipment. Over 100 members attended, and the Air Filter Co., treated to hot dogs, crabs, shrimps, drinks, etc.

The regular meeting, May 27, was held in the Roosevelt Hotel. A member, Maurice G. Thiele, sales engineer, Menge Pump & Machinery Co., delivered a paper on the centrifugal pumps. He used cut-away pumps for demonstration purposes. Following Mr. Thiele's paper, a sound and color film, "The Inside Story," dealing with Industrial Lubrication, was shown through the courtesy of the New Orleans Petroleum Corporation.

On April 30, 1953, Robert Faget passed away. Mr. Faget was a member for many years. He had over 50 years of engineering experience, having served as chief engineer of many large plants and erecting engineer for large refrigeration manufacturing firms. He was president of IUOE, Local 226, a member of the Central Trades and Labor Council, member of the Board of Examiners for Operating Engineers, New Orleans, and member of the ASRE.

On June 5, 1953, another member, James Duffy, passed away. Mr. Duffy also was a member of Louisiana Chapter for many years. He was Past President of the NAPE local chapter, member of many religious organizations, and Chief Engineer for the Elmer Candy Co., New Orleans. We will certainly feel the loss of these two members, miss their advice and assistance.

Rio Grande Valley

ARMIN DONEIS

AT THE meeting of April 14, instructor John Muller introduced representatives of the Southport Paint Co., who proceeded to explain the use of residual gums and resins of the cotton-oil industry in the compounding of roofing, waterproofing paints for concrete, caulking compounds and industrial finishes. They gave several interesting demonstrations of their product's ability to resist deleterious effects of prolonged high heat exposure, and also its ability to make porous concrete blocks completely impervious to moisture, so that they could hold water in or out indefinitely.

At the meeting April 28, instructor Muller introduced as speaker of the evening Tom Simpson, Houston, who represents the Metalizing Engineering Co. Mr. Simpson gave us many interesting and amazing facts about the process involved in metalizing, and answered many questions about the strength of bond, application of metalizing for corrosion control, variety of metals used, and the wide range of applications, including the making of molds for plastic skulls and skeletons used in medical schools. He stressed the economy in repairs and the improved operation of brand new equipment when metalized before being placed in operation. He offered the use of a film on metalizing, which our Chapter accepted with alacrity. Next month we will tell you all about the RGV clubhouse.

Stockton-Modesto

HARRY DWYER

MOST members of Stockton-Modesto Chapter have written the State Assembly on the licensing of engineers. Committeemen mailed us several copies of the bill. At our last meeting, held at the Santa Fe Ice Plant in Stockton on May 5, we discussed the bill and find that in some cases it does not cover all members of our chapter. Nevertheless it is believed that each of us should apply for the license if the bill is passed, in the event we decide to change firms, we will be licensed. The chapter is continuing with the King course and are benefitting by it. We are striving for new members and sincerely hope that by fall we will have most of the old members back with us and several new ones. Some good prospects have shown up and we certainly are going to follow through on them.

Memphis

CHAS. CONLEY

AT our May 6 meeting, H. L. Todd, the Chapter's instructor talked on pages 245 to 250 of the Guy King refrigeration course. The Chapter voted to recess the educational meetings during the months of June, July and August, holding only business meetings.

Our meeting of May 20 was advanced to May 18 to favor our National Secretary, Dick Kelahan, who was in the city on that date with A. J. Clay, our National President. The meeting held at Hotel Chisca included dinner and refreshments. Secretary Conley and Past President Cecil Sullivan fed questions to the National Secretary. As the evening progressed, other members entered the round table discussion. Consensus of opinion of the Memphis members was to effect that NAPRE can render considerable assistance to Chapter members. Three items were urged for presentation to Board of Directors: planned membership drives, suggested chapter educational programs, and certificates for refrigeration course.

National Headquarters should undertake a membership drive on a national scale with the cooperation of Chapters. There are some 27 industries employing refrigeration men. We should put on a two-year drive with one major industry as a goal each month. Literature, Operating Data Books and applications should be furnished by National Headquarters. General leads should be furnished also by National Headquarters.

National Headquarters should furnish Chapters with model annual Chapter program or calendar. Younger, more enthusiastic officers coming in are not trained, and older members are too busy today to give more than limited time. Instructors should be assisted by providing them with a manual which would contain references for audio-visual aids on each Chapter, suggested speakers to augment, not repeat, instruction and suggested field trips. Provide calendar for Chapters meeting semi-monthly and monthly in order that all wind up the refrigeration course at approximately the same time.

To encourage more younger men to attend Guy King's course on refrigeration, National Headquarters should provide Chapters with material to issue post card notice to employers informing them that their engineer has enrolled and a brief description of the course coverage. As each section is finished, send out another post card follow-up, and when course is complete issue certificate suitable for framing.

Detroit

LEON ADAMS

THE Michigan Chapter, NAPRE, on Thursday, May 21, 1953, at its regular meeting was lectured by Dr. Edgar S. Ross of the Sun Oil Company, Philadelphia, Pa., well known national lecturer on petroleum products.

Members learned that petroleum is composed almost completely of carbon-hydrogen compounds, with small and variable amounts of sulfur, oxygen and nitrogen, and usually small amounts of inorganic salts. The main homologous series of compounds found in petroleum being paraffins, naphthenes, and aromatics. Asphaltic material, which we understand is a product of partial oxidation of hydrocarbon material, is also present. Dr. Ross explained the three major classifications of Crude Oils; paraffin base, naphthene base, and mixed base.

Our speaker discussed the processing of crude petroleum by modern refineries as a continuous manner by heaters, distillation columns, and further fractionation; i.e., after the removal of non-lubricating oil fractions, the residue containing other desired oils being heated to high temperatures to effect further separation under high vacuum. He also described more specialized refining steps required for specific lubricating, such as acid treatment, solvent refining, clay filtration.

Dr. Ross emphasized that the relative proportions of products derived from a given crude oil depends on the nature of the crude and the distillatiton process employed, as well as the objectives sought—the following being the fractions of major significance to the refiner: hydrocarbon gases; light distillates — gasoline naphtha, kerosene; heavy distillates—lubricating oil, waxes, fuel oil, road oil, asphalt, coke.

The wide range of uses for lubricating mineral oil was covered, and the selection of proper refrigeration compressor lubricant. Effect of refrigerants on lubricating oils was discussed, which brought forth many questions. It was pointed out that oil literally never wears out. It never loses its lubricity, but it becomes contaminated by operating conditions, and contamination causes trouble. If a heavy sludge takes place, it will increase the viscosity of oil so that it can't go into the space where it is required and clogs. Contamination, from whatever source, prevents the oil from doing its job. An oil filter holds down the action of abrasive matter—to keep the oil clean —but if the oil filter does not function, oil won't be clean. There was also mention of inhibitors to prevent sludge, the use of additives and catalysts to arrive at end products suitable for specific conditions.

Dr. Ross stated that in the days when commercially used refrigerants had little or no solubility effect on the oils used, it was not necessary to be concerned about viscosity dilution, wax formation, etc.; but, with the prevalent use of halogenated refrigerants, it is important that more be known about the oil-refrigerant relationships, such as miscibility, solubility in both liquid and vapor phases, emulsibility, and the effect or function of temperature and pressure on these relationships. He stated that considerable work has been done along these lines by both refrigerant and oil manufacturers. Today more information is readily available on this subject.

The illustrated lecture was most interesting and educational. Members of ASRE, Refrigeration Contractors Association and RSES were guests of the Detroit Chapter. A dinner preceeded the general meeting.

Colton

HARRY BONTER

THE regular meeting of California Chapter No. 5, on May 13, was held at the Santa Fe plant lunch room, San Bernardino, Calif. After the business session, instructor F. J. Scherer took up the class lecture on the refrigeration course by Guy R. King. It was followed by discussions which proved to be very educational for the group. The membership asked for a trip through the Lucky Lager Brewery at Azusa, Calif., on June 10. After the meeting, the group enjoyed the usual lunch.

Seattle

JIM BENNETT

THE regular meeting of Seattle Chapter was held at the Central YMCA, May 14. Frank Gellert had a good program. Floyd Burris acted as moderator for the discussion period. The following new members were initiated into the Chapter: Roy Griggs, Chief Engineer, James Henry Packing Co.; Bill Zimsen, Arctic Maid Fisheries; Louis Beriault, Orthopedic Hospital; Frank Storberg, James Henry Packing Co.; Clarence Hislop, Ballard Ice Arena.

Members-at-Large

LEO VIVIEN

A RECENT visitor was an Australian, J. J. Budge, a member of NAPRE since May 1938, who in his own words, "feels he has known many of its prominent members for many years because he has seen their photos so often in ICE AND REFRIGERATION."

Joe Budge is general manager, James Budge Proprietary Limited, refrigeration engineers of Sydney, Australia. His company manufacturers ammonia compressors and all the components making up industrial refrigeration systems. The photographs he brought with him gave a very favorable impression of the quality of the product made "down under". The company does contract work, installing the equipment they manufacture. There are representatives of his company in all states of Australia. Members may not realize that Australia has an area about equal to that of the United States of America, although the total population is only ten million, and is mostly along coastal areas.

It was convenient for Mr. Budge to attend meetings of the San Francisco and Los Angeles Chapters during his visit. At the first of these the popular practice of "buying the ticket" was followed and Mr. Budge had the luck to secure one dollar to assist in paying his expenses! At NAPRE headquarters, the Secretary and Mr. Budge exchanged notes on the activities of NAPRE and the Australian Institute of Refrigeration, of which Mr. Budge is past Divisional Chairman. It was interesting to see how closely the methods and problems of the two organizations parallel each other.

Another member, G. McMillin, writes, in response to a letter from our Secretary, "following August 1923,

I have been an employee of the Pacific Fruit Express Company at Pocatello in various capacities from Iceman to Plant Manager. At the present time I occupy a Shift Engineer position. Initial employment with the PFE was under the direction of Mr. L. Etzel, and from 1925 to the present under the direction of Mr. H. Branham, both of whom are directors and have been affiliated with the Association for many years. Am also acquainted with Mr. R. R. Willecke, Pocatello Cold Storage Co."

Walter J. Mikker, a 30-year member, NAPRE, recently wrote our national office, "I would like to take this as an opportunity to thank you for the fine letter of congratulation which you sent me regarding my thirty years membership in the NAPRE. Also, regarding your inquiry as to my present employment and home address, I have recently been retired from The Telling Ice Cream Company with whom I had been employed for the past 42 years. I plan to spend most of my time in the near future traveling, visiting friends and relatives. Again, I say thank you for the kind words and my only thought is that I didn't realize how many years I have been a member. Every year has been a pleasure and I am awaiting the next fall meeting at Purdue University with keen interest and hopes of meeting Professor Venemann and other officers personally."

Know Your Officers

THIS month our column is given over to a little description of our National Treasurer, and the Sergeant-at-Arms for our Association.

Treasurer Leland Kenagy began his technical training at Finley Engineering College, Kansas City, Mo., in electrical engineering. Since that time, while on the job, Lee has extended his training in electrical engineering through correspondence, and more recently completed a course in personnel management with the extension school of Kansas University.

Leland Kenagy

In 1930, our treasurer went with Newton Ice Company as a plant engineer, in 1943 became the chief engineer, and in 1951 the general manager. He joined NAPRE in 1932 and became the national treasurer during the 1946-47 term. Lee is active in service, fraternal and Church groups, in Newton, in addition to his NAPRE activities.

The Sergeant-at-Arms of NAPRE, elected last November, is Wm. Ray Burnett. Ray is famous in NAPRE for his chapter membership drives and membership promotion ideas. Joining NAPRE through California No. 2 in 1925, Ray went through the chairs to become the President in 1940.

Wm. Ray Burnett

After three years of engineering training at the Los Angeles City College, our Sargeant-at-arms entered his operating career at the Pasadena Ice Company in 1922. He was the assistant chief at the Home Ice Company from 1924 to 1937, becoming chief engineer at the end of that period. In 1944, he shifted to Royden Ice Company as chief engineer where he is today. Ray is now actively connected with an aeronautical group at Los Angeles and other fraternal and civic groups.

Michler Goes With Industrial Marketing

ANOTHER recent change in refrigeration personnel field was the move of NAPRE member Harold W. Michler to Industrial Manufacturing & Engineering Company. Harold, Sgt-at-Arms of the Chicago Chapter, becomes engineer for the firm headed by August J. Brandecker. Mr. Michler will spend his time between the manufacturing firm's headquarters at 3033 West Belmont Avenue, Chicago, and the plant at Polo, Ill.

Mr. Michler was formerly with Westerlin & Campbell, under the supervision of Eugene Rytlewski, recently a National Director of NAPRE. After studying at Illinois Institute of Technology, he spent a year with Delta Star Electric Co. and served three years with the Naval Amphibious Forces.

Sales of Refrigerating Equipment in Canada

FACTORY sales of refrigeration equipment manufactured or assembled in Canada totalled $65,039,355 in value in 1952, according to a summary compilation by the Bureau of Statistics. The greater part of this total is accounted for by sales of 244,374 household mechanical refrigerators — electric and gas — worth $49,005,858. Among the other types of equipment making up the remaining $16,033,497, some of the larger items in value were: Ice cream cabinets, $1,976,956; beverage coolers, $1,376,612; home freezers, $1,286,675; display cases, $1,331,079; compressors and condensing units domestic, $2,301,505; and commercial, $1,464,107.

New Ice and Fish Plant in Faroe Islands

A CORPORATION, the Faroe Ice and Fish-fillet Co., Ltd., with a preliminary paid-in capital of about $89,000, has been formed in the Faroe Islands to counter unemployment by creating a new enterprise there, according to the Danish press. The company's plant will be at Tveraa, on Suderoe. Before entering the fish fillet field the company intends to operate a line of small ships and to manufacture ice in sufficient quantities to meet the needs of the Islands.

FrozenFoods

*Reg. U. S. Pat. Off.

PREPARATION PACKAGING FREEZING STORAGE DISTRIBUTION DESIGN CONSTRUCTION EQUIPMENT

1954 National Frozen Food Convention to be Held In New York City February 1 - 4

THE next national frozen food convention has been scheduled for February 1-4, 1954, at the Commodore Hotel in New York City, according to an announcement by M. K. Spiegl, President of the National Association of Frozen Food Packers. Under the sponsorship of the N.A.F.F.P., plans will be made for a broad program of interest to all segments of the frozen food industry—packers, brokers, distributors, chain store and private label buyers, warehousemen, suppliers, and allied industries. All groups will be cordially invited to attend and participate in the proceedings.

The N.A.F.F.P. will shortly name a Convention Committee to begin making plans for a full-fledged all-industry convention. Representatives of allied industries will be invited to act as consultants to the Convention Committee, to be certain that all elements are fully represented.

It is contemplated that the program to be arranged will focus attention on the full scope of major industry problems, ranging all the way from production to transportation, warehousing, sales, promotion, merchandising, consumer attitudes and related subjects. Intensive consideration will be given to broad industry objectives as well as practical operating problems. The authoritative report on the frozen food industry presented at the 1953 convention by Edwin L. Morris, of Booz, Allen & Hamilton was so well received and created such wide interest that plans will be made for additional reports of this nature to be given at general convention sessions. Nationally known speakers will provide the industry with objective appraisals of its progress, problems, and future.

Social events which have become traditional at frozen food conventions will also be featured at the Commodore meetings. Initial plans call for a cocktail party, an industry luncheon, and a grand banquet.

The Commodore Hotel was chosen to house the convention because of its outstanding facilities for handling large meetings of this kind. There will be plenty accommodations for convention delegates, and suitable rooms for the general convention sessions, the many social events, private meetings, panel discussions, and for displays.

Frozen Fruit and Vegetables Production Set New High Record in 1952

PRODUCTION of frozen fruits and vegetables reached an all-time high of 1,316,021,803 pounds in 1952, according to a report by the National Association of frozen food packers. This compares with total of 1,185,983 pounds produced in 1951. The fruit pack amounts to 420,303,232 pounds and the frozen vegetable pack was 895,718,571.

These statistics were compiled from reports received from individual packers. The packs for which data are given represent the commercial pack and do not include quantities of fruit frozen by industrial users or other types of processors who use all or the largest portion of their frozen pack as raw material for the manufacture of jams, jellies and other fruit spreads, ice cream, bakery goods, or alcoholic beverages. Furthermore, the data given in this bulletin do not include custom freezing for industrial users nor quantities produced in frozen food locker plants.

A summary of production since 1942 and details of frozen fruits and vegetable packs for the past three years appear in the tables that follow.

PRODUCTION OF FROZEN FRUITS AND VEGETABLES, 1943-1952 (000 LBS.)

Year	Fruits	Vegetables	Total
1943	187.3	207.9	395.2
1944	323.9	237.1	561.0
1945	427.0	308.0	735.0
1946	519.1	450.0	969.1
1947	343.5	346.2	689.7
1948	369.7	446.4	816.1
1949	354.0	563.5	917.5
1950	472.2	587.1	1,059.3
1951	415.9	770.0	1,185.9
1952	420.3	895.7	1,316.0

As shown in the tables, three vegetable items showed a decrease over last year: Brussels sprouts, rhubarb, spinach and succotash. On the other hand a number of fruit items showed decreases, including apricots, red cherries, sweet cherries, prunes, blueberries, blackberries, gooseberries, red raspberries, loganberries, and black raspberries.

PRODUCTION OF FROZEN VEGETABLES 1950-1952 (000 LBS.)

Item	1950	1951	1952
Asparagus	22,309	23,562	25,460
Beans, Green and Wax	65,529	81,650	87,438
Beans, Lima	85,988	108,020	113,926
Broccoli	41,028	48,768	82,253
Brussels Sprouts	22,439	22,476	22,454
Carrots	13,338	10,573	22,269
Cauliflower	12,339	22,428	33,166
Corn, Cut	32,998	44,549	62,684
Corn-on-Cob	10,069	8,772	14,196
Mixed Vegetables	15,241	26,088	26,472
Peas	152,275	195,541	203,726
Peas and Carrots	11,335	12,947	18,033
Pumpkin and Squash	8,325	12,723	15,068
Rhubarb	6,164	5,803	5,684
Spinach	52,806	97,878	91,464
Succotash	6,659	11,913	11,769
Miscellaneous Vegetables	28,259	36,348	59,656
Total	587,101	770,038	895,719

PRODUCTION OF FROZEN FRUITS 1950-1952 (000 LBS.)

Item	1950	1951	1952
Apples & Applesauce	48,013	28,772	37,649
Apricots	7,802	9,869	4,155
Cherries, Red Tart	104,459	99,282	61,867
Cherries, Sweet	742	2,251	2,411
Grapes & Pulp	15,189	4,799	4,937
Peaches	25,791	32,380	35,454
Prunes	5,144	6,791	3,588
Blackberries	8,973	14,574	10,628
Blueberries	10,900	13,921	9,848
Boysenberries	9,443	9,309	9,683
Currants	1,276	1,505	2,943
Gooseberries	138	136	96
Loganberries	2,639	2,419	1,795
Raspberries, Black	10,939	9,559	9,003
Raspberries, Red	20,439	19,414	18,365
Strawberries	192,732	157,729	200,302
Miscellaneous Fruits & Berries	7,239	3,090	7,578
Total	471,855	415,799	420,303

Frozen Foods

Frozen Food Distributors Convention February 21-24

ANNOUNCEMENT of The Waldorf-Astoria in New York City from February 21 to 24, 1954, as the site and date of the next National Frozen Food Convention on Distribution has been made by Joseph Gaudio, president of the National Wholesale Frozen Food Distributors Association. The rapid growth of the frozen food industry, which overtaxed the facilities of the Conrad Hilton in Chicago at the March, 1953, Convention, has led to a splitting of functions for future years, according to Mr. Gaudio, who stated:

"The Board of Directors of the Distributors Association has enthusiastically enlisted en masse to serve the entire industry by staging the most valuable and extensive national convention on merchandising frozen foods ever attempted. We have cordially invited the full cooperation of suppliers, packers, brokers, distribution warehouses, retailers and institutional buyers.

"Major brand packers have promised their full support in setting a new high standard for the industry convention. They endorse our view that the three-fold theme of this convention should be: 1. selling, 2. more selling, 3. ever more selling.

"We are advised that the National Association of Frozen Food Packers has engaged the Commodore Hotel, also in New York City, February 1 to 4, 1954 for their own convention on processing problems. Although the Waldorf has the largest floor space of any hotel in the world, its facilities are nevertheless inadequate for both these merchandising and processing conventions simultaneously. The new dates for the technical sections, which the packers are best qualified to conduct, will permit plant operation experts to attend the canners convention in Atlantic City just prior to meeting at the Commodore.

"At the National Frozen Food Convention on Distribution in late February, Mr. Gaudio pointed out, "new milestones in frozen food sales and progress will be emphasized by exhibits and speaker panels that will make major headlines. We have also engaged the Grand Ballroom of the Waldorf, February 21, 1954, for a capacity gathering at the traditional cocktail party as well as for a luncheon the next day, and the concluding grand banquet. Mornings will see from two to five panels in simultaneous operation in different halls. Afternoons will be kept completely clear for individual business contacts.

"Over a year ago we felt that our industry had sufficiently come of age to start planning for this major event, so we reserved these dates at the Waldorf. It is a pleasure now to head for the Eastern Seaboard for the first time with the biggest planned demonstration of progress in frozen food history."

Dry Ice vs. Mechanical For Frozen Citrus Concentrate

AN interim report on a test comparing dry ice and mechanical refrigeration in the transportation of frozen citrus concentrate by motor truck has been issued by the Production and Marketing Administration of the United States Department of Agriculture. The report was prepared by C. Elliott Garver and Martin V. Gerrity, Marketing and Facilities Research Branch and J. R. Winston and R. H. Cubbedge, Bureau of Plant Industry, Soils and Agricultural Engineering. Results of the test are summarized as follows:

This test was conducted to compare the effectiveness of dry ice as a refrigerant distributed over the load in a truck, with that obtained by mechanical refrigerating units. In the test, three truck loads of frozen citrus concentrate were transported from Plymouth, Fla., to New York, N. Y., in July 1952. Two of the trailers used mechanical refrigerating units, one of modified construction providing greater clearance at the side walls and floor for freer circulation of air and with return air ducts leading to the unit, and the other of conventional construction. The dry ice trailer was of conventional construction equipped with a mechanical refrigerating unit which was used in this test on one occasion only.

The modified trailer with mechanical refrigeration provided temperatures closest to the desired level and most uniform throughout the load. Temperatures in the conventional trailer were lower at the top of the load and considerable higher at the bottom of the load, because of inadequate circulation of air. The trailer using dry ice had high temperatures at both the top and the bottom of the load, with only three locations in the load near the desired level. This method of using dry ice to hold temperatures near O F. level was not as effective as the mechanical units. Somewhat better results might be obtained with this method, however, by using a trailer with ample provision for positive circulation of air around and under the load.

Freezing Industry Unites To Boost Nutrition Program

WELL over $200,000 has been jointly subscribed by allied industry and the National Association of Frozen Food Packers in support of the Association's five-year Nutrition Research Program. This program is being undertaken to establish adequate and reliable nutritional values for frozen foods in response to the great demand for this information from dietitians, medical people, homemakers, governmental agencies, students, etc. This announcement was made by Messrs. E. J. Watson of Pictsweet Foods, Inc., and Ralph O. Dulany of John H. Dulany & Son, Inc., chairman and vice-chairman of N.A.F.F.P.'s Nutrition Fund Raising Subcommittee.

The response from allied companies manufacturing cartons, cans, cases, overwraps, insulating materials; processing, packaging, overwrapping, refrigerating and freezing equipment; and from broker, transportation and warehouse groups was so favorable that with the conclusion of the drive for funds, the goal was oversubscribed. Because of recent inflationary trends, it was found that the original estimates of funds required to adequately finance the extensive program were too low. It is now evident that additional funds, over and above those already subscribed, will be needed. Although active solicitation has been terminated, it was announced, further contributions will be accepted from those wishing to participate in the program.

Effect of Freezing Cooked Egg White

IN precooked frozen foods, cooked egg white becomes granular, rubbery, and watery and separates into clumps according to a report reviewed by The Western Regional Research Laboratory. Studies conducted did not solve the problem but did reveal some basic factors involved. During ordinary freezing, ice crystals grow and damage the structure. During thawing, the watery phase is not reabsorbed. Variation in time of cooking revealed no improvement. Damage was reduced somewhat by rapid freezing following supercooling, which was most frequently obtained in the 0 to -10 F. range. Variation in pH of the white was not beneficial. Additives such as salt, glucose, glycerin, and vegetable gums gave no improvement but gelatin gave some improvement, apparently, it was believed, because it increased the frequency of supercooling.

Corrosion In Refrigerating Systems

R. G. RYDELL

National Aluminate Company

A THOROUGH discussion on the theory of corrosion as well as possible means of prevention was given by R. G. Rydell of National Aluminate Company before the Chicago Section of the American Society of Refrigerating Engineers, Thursday, January 8, 1953.

Corrosion was likened to a battery cell; that is, a difference of potential exists between the anode or portion of metal which corrodes and the cathode or portion which does not corrode. Currents flow through the corroding solution which acts as the electrolyte in the process.

There are known today some seventeen reasons for this potential difference, such as point temperature differences, abrasions of the metal surface, differences in composition of corroding solution and differences in oxygen content of the solution, the aforementioned being stated as the more important reasons.

Polarization, or the combination of electrons at the cathode with hydrogen ions in the dissociated water, causes the hydrogen atoms to plate out in a film on the metal surface which resists the current flow in the corrosion cell. The polarization is nullified, however, by the formation of molecular hydrogen in acid environment, and the formation of water by combination of dissolving oxygen with hydrogen atoms in neutral or alkaline water.

Results of Test

Specific data was presented from tests conducted in brine spray coolers at the plant of Wilson and Company. The nature of the brine makes it a good conductor which results in current flow and accelerated corrosion. This conductivity factor also makes coupling of dissimilar metals a serious problem in brine solutions.

The method of corrosion protection desired is the formation of deposits in the form of a tough, thin film which effectively inhibits corrosion. The type of deposit and adherence to the metal surface determine its effectiveness.

In addition to the special alloying and plating of metals, several additives to the liquid in the system tend to give the protective film desired. The following are several mentioned for this purpose: phosphates, chromates, silicates, organic corrosion inhibitors. Combinations of these are also employed.

Although the chromates as a class are good corrosion inhibitors, their use is somewhat limited due to toxicity and therefore could not be used in the test at Wilson and Company nor could this material be employed in other food processing. Polyphosphates, on the other hand, do not protect non-ferrous metals.

The PH of the solution is also of important consideration, and it has been found that range from 7.0 to 8.5 gives optimum results.

A complete description of tests made by placing coupons of 24 ga. mill galvanized steel in brine coolers having brine of varying concentrations was given along with a display of the coupons used. The inhibitors used in the test were of the following classes: polyphosphate-silicate, ortho phosphate blend, boron compounds, organic compounds. As a practical solution to the problem of chemical addition, one pound per day of inhibitor was added.

The test results, determined by examination of the test coupons indicated that the most effective inhibitor in the case of the brine cooler tests was the polyphosphate silicate, and it was determined that the ratio of polyphosphate to silicate was not critical between certain limits.

A brief discussion of the water treatment problem in the case of refrigeration condenser cooling water was also given. The problems encountered in this type of system, especially where water is recirculated are corrosion, scale and microbiological activity.

The evaporative cooling of water increases the concentration of mineral constituents since these are precipitated in the evaporative process. When the point of maximum solubility of the scale forming minerals is exceeded, scale is deposited. Blowdown or rimoff of the recirculated water was recommended to hold down the concentration of solids.

Two possible additives, depending on the type of hardness and concentration have been developed, and the feed of these materials to smaller systems can be accomplished by enclosing in a wire basket hung at the outlet in the cooling tower or evaporative condenser collecting basin.

Efforts are being made to develop both the corrosion inhibitors and water hardness treatments into a briquette form having the proper rate of dissolution, so that simplification of application will be achieved.

Brakes a Big Safety Factor

A SAFETY letter issued by W. F. Leonard Jr., chairman of the Ice and Cold Storage Division of the National Safety Council calls attention to the importance of reliable brakes on autos and trucks.

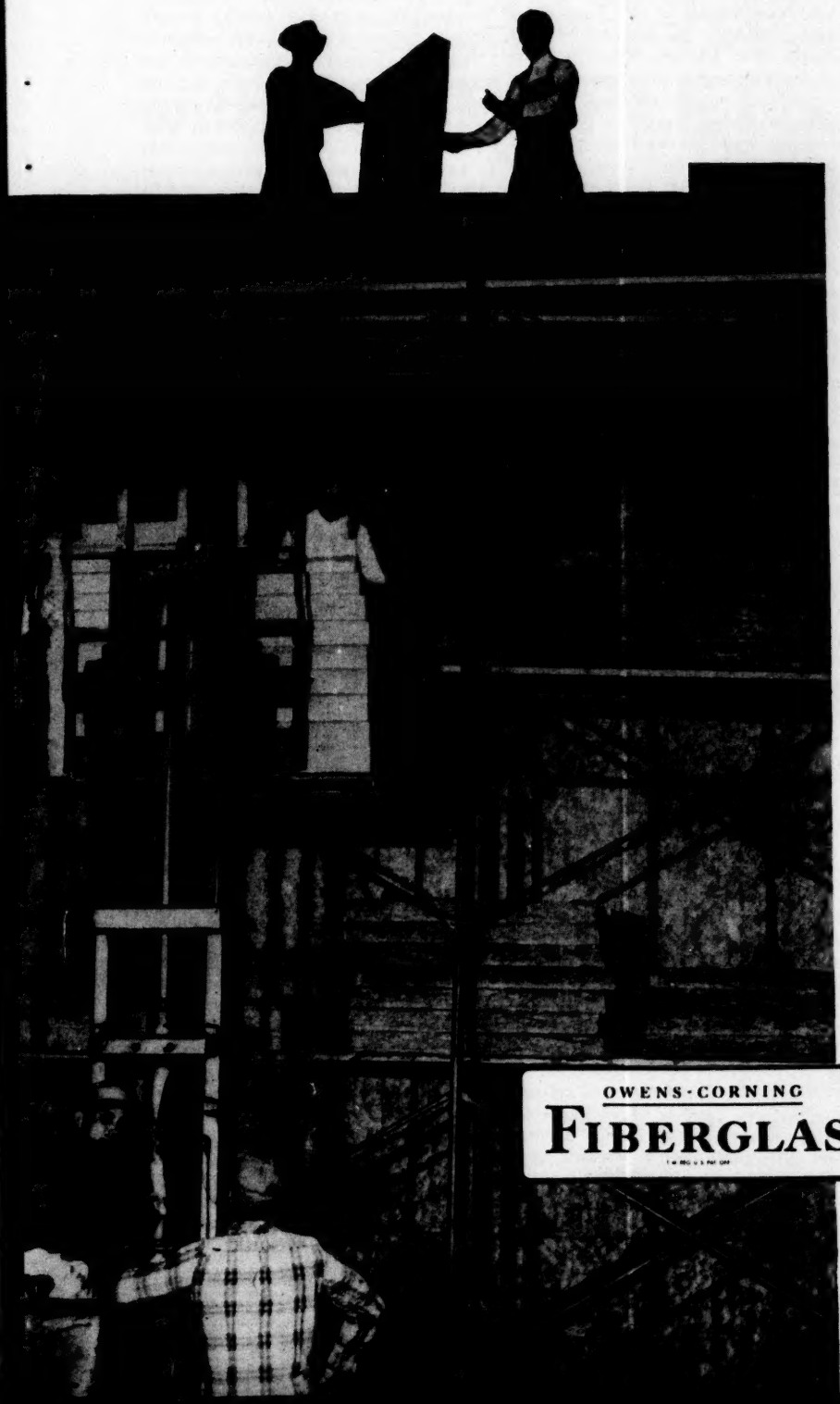
There was a time in the early development of the automobile, it says, when the main problem was increasing the power to start and to roll faster. Today, with high-powered and high speed cars and trucks, the factory engineers are giving much of their attention to the brakes; increasing the size of the brake drums; developing more efficient brake lining; replacing mechanical action with hydraulic action; making hydraulic action more effective with vacuum-booster equipment and finally to the point of complementing hydraulic action with the present-day powerful air-brake equipment. These engineers are trying to improve even greater the efficiency and dependability of the brakes on cars and trucks because they know that even today's fine brakes are not perfect.

"Today's brakes are not perfect." Let's repeat that line to ourselves—let's keep it in our minds at all times—"today's brakes are not perfect." Let's also remember that where the engineer's left off, drivers of cars and trucks must begin. We must have our brakes checked often for good operation; checked for leaks in hydraulic lines and connections; checked for an adequate supply of hydraulic fluid in the master-cylinder; checked for the condition of the brake linings and brake drums. Drivers of cars and trucks have learned from experience to watch the fuel gauge. In the old days it was necessary to stop and remove the front seat cushion and put a stick into the gas tank to check the amount of gasoline but the engineers improved this method into today's electric gauge so we now watch this gauge constantly. Let's be just as *watchful* and concerned about our brakes, or lack of brakes. Let's test our brakes frequently and especially during long straight-a-way drives. Let's get into the habit of putting the little old right foot on the brake pedal and taking a gentle feel, a feel for security and safety. We don't have to remind you that this "little gentle feel" may mean life or death to you, your loved ones or to somebody else and his loved ones.

Office Management Chapter Elects Iceman President

REUBEN A. LEWIS, assistant treasurer of Diamond Ice & Coal Company was elected president of the Wilmington Chapter of National Office Management Association recently. He is a charter member of the Wilmington Chapter.

3 huge freezer plants make insulation history with new **Fiberglas** method



There's a new and better answer to the constant search for more effective, lower cost cold storage insulation. It's Fiberglas* PF Insulation for "dry wall" construction, used in combination with Fiberglas AE-F Board for floors and Fiberglas Roof Insulation.

In the South, three big freezer plants have just been completed, employing the improved specifications. Totaling 3 million cubic feet of freezer space and using over 5 million board feet of Fiberglas Insulations, these jobs are:

Leesburg Freezer Company, Leesburg, Fla.
Mid-South Refrigerated Warehouse Company, Memphis, Tenn.
Pasco Packing Company, Dade City, Fla.

Installations were made to hold temperatures at –20° F. In each case, a competitive insulation had been used for years. But all three jobs went "Fiberglas" because of conclusive proof that this new method would provide outstanding efficiency and improved design permitting worth-while savings to owner and contractor.

Fiberglas PF Insulation has an exceptionally low "k" value. Since its application requires no hot asphalt, the fire hazard is reduced.

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- *High in quality and efficiency*
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Book Review

HEATING VENTILATING AND AIR CONDITIONING GUIDE, 31st Edition. Published annually by The American Society of Heating and Ventilating Engineers. 1560 pages. Illustrated. Price $7.50. For Sale by Nickerson & Collins Co., Chicago, Ill.

This 1953 edition of The Heating, Ventilating and Air Conditioning Guide, has a total of 1,560 pages and features many important changes and additions. The Technical Data Section has been increased by 32 pages to a total of 1096 pages—the largest to date. The Manufacturers' Catalog Data Section has also been enlarged to 432 pages.

Among the new and improved features of this volume are a new section on snow melting, completely rewritten chapters on electric heating and industrial exhaust systems, as well as, a new chapter on water vapor and condensation in building construction. New information has also been added on industrial oil and gas burners, short chimneys, industrial degree-days, warm air system design and unit heaters.

The 51 chapters are grouped in seven sections and include such topics as: Fundamentals, Human Reactions, Heating and Cooling Loads, Combustion and Consumption of Fuels, Systems and Equipment, Special Systems and Instruments and Codes.

The ASHVE Psychrometric Chart is included separately in large size, 24 x 32 in., and is printed in two colors to facilitate the solution of problems involving air. This chart is based on the most widely accepted data on moist air tabulated in the chapter on Thermodynamics.

1953 HANDBOOK OF BRITISH REFRIGERATION MATERIAL and Home and Overseas Buyer's Guide. Published by "Modern Refrigeration," Empire House, St. Martin's-Le-Grand, London, E.C.1. 290 pages., illustrated. Price $3.00 post-free.

The 1953 edition of the Handbook Of British Refrigeration Material and Home and Overseas Buyers' Guide has been published by "Modern Refrigeration" of Empire House, St. Martin's-Le-Grand, London, E.C. 1. This Sixth Edition is profusely illustrated with photographs and drawings of the latest in British machinery, power and plant equipment. Business addresses in all sections of the trade are given, and a classified index of materials makes this volume an essential trade reference guide to all concerned with refrigeration. The various technical and trade organizations are dealt with, and technical information and tables is included.

INDUSTRIAL HEAT TRANSFER. By F. W. Hutchinson, Professor mechanical engineering, University of California. Published by Industrial Press, New York. 336 pages. Illustrated. Price $6.00. For sale by Nickerson & Collins Co., Chicago.

Professor Hutchinson, nationally known as a consultant on heat transfer, has authored another book. The solution of problems on heat transfer between industrial fluids involves the solution of complex formulas as well as time-consuming determination of viscosity, specific heat, and density of the fluids. This book, through use of 128 working charts from which a direct solution of heat transfer problems can be obtained, simplifies solution of problems involving 70 industrial fluids ranging from air and acetylene to sulfur dioxide and water. These graphs are equal in accuracy to the equations from which they are derived.

The book includes considerably more than the graphical solutions. As a further aid, the page opposite each graph gives the equation for the graph, its limitations, its extension, and the references to the discussion of that equation in the text. An actual example is given and its solution is shown on the graph. Examples have been selected which not only demonstrate the use of the graphs, but also illustrate typical solutions of heat transfer problems.

Each chapter in the book consists of three parts. At the beginning of each chapter the fundamental theory is discussed and the equations relating to the evaluation of heat transfer coefficients and rates are developed. At the end of the chapter are presented the graphs referred to in the foregoing.

DAIRY ENGINEERING, second edition, by Arthur W. Farrall, published by John Wiley & Sons, New York. 478 pages. Illustrated. Price $6.00. For sale by Nickerson & Collins Co., Chicago, Ill.

The major objective of this second edition is to make possible greater efficiency in dairy plant operation and in the selection, installation and management of equipment. Surveying every engineering aspect of this industry the author deals with the physical and chemical properties of milk, refrigeration principles, insulation and cold storage. One chapter, of 68 pages, covers principles of refrigeration, and another of 18 pages is on insulation and cold storage rooms. The author has been a research and educational leader in agricultural engineering for over thirty years and is now head of that department at Michigan State College.

FATHER OF AIR CONDITIONING, By Margaret Ingels. Published by Country Life Press, Garden City, N. Y. 170 pages. Illustrated. Price $2.50. For sale by Nickerson & Collins Co., Chicago.

Depicting the life of the late Dr. Willis H. Carrier, this book is the story of a man, that of the company which he founded and of the industry which he pioneered. The author, Margaret Ingels, was for thirty-three years a close working associate of Dr. Carrier. One of the first graduate women engineers in the country, she demonstrates in her writing a rare combination of talents—the technical background to understand the achievements of Dr. Carrier and the ability to describe them in lay terms.

In 1948, the author began the huge task of research and documentation which was necessary before actual writing could begin, and this information was supplemented by a series of ninety-six interviews with Dr. Carrier himself. Written in non-technical terms, the book unfolds in chronological order the story of Dr. Carrier's boyhood, his education, his start in business and the early trials and tribulations of the then infant air conditioning industry. It traces the milestones in the development of modern air conditioning and at the same time gives an insight into minds of Dr. Carrier and his associates as they pioneered one new development after another.

In addition to being the chronicle of a man, it is also a record of a phenomenon that is typical to the United States and its free enterprise economy, the success of a group of men who have faith in an idea.

COLD CHAIN IN THE U.S.A. A report of a group of European experts. Published by the organization for European Economic Cooperation, Paris, France. Paper Binding. Illustrated. 76 and 450 pages. Price, Part One, $1.50; Part two, $6.50. For sale by Nickerson & Collins Co., Chicago, Ill.

This book, in two volumes, constitutes the report of a mission of 50 experts form 12 countries of Western Europe who visited the United States in 1951 to study the various aspects of refrigeration in the food industry and describes recent American techniques in the manufacture of equipment. The second volume contains detailed reports illustrated with photographs, diagrams and drawings, providing a source of practical information directly accessible to industry and commerce in the fields covered generally in the first volume. It is expected that this book will be of use in Europe at a time when food must be better preserved and distributed and waste avoided.

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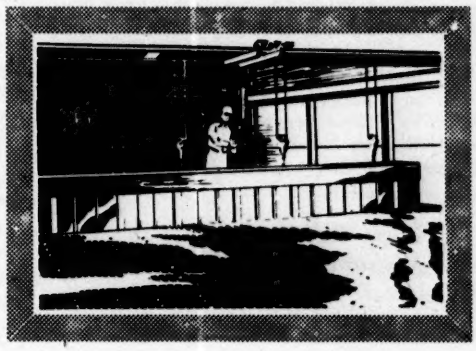

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REFRIGERATION IN AMERICA, by Oscar Edward Anderson, Jr., published by Princeton University Press with aid from the Charles Phelps Taft Memorial fund, University of Cincinnati. 344 pages. Illustrated. Price $6.00. For sale by Nickerson & Collins Co., Chicago, Ill.

Adding to the literature on refrigeration is this historical survey of the development of refrigeration in America. This 344-page volume covers natural ice, the ice industry and domestic refrigeration, refrigerated transport, refrigerated warehousing, mechanical refrigeration, frozen food, locker plants and home freezers. Primarily a historical sketch it also turns attention to the impact of refrigeration upon the economies, business and health of the nation.

The author, covering a two-century span from 1750 to 1950, shows the progress and the relation of refrigeration to our national development, records the main trends in technological achievement, describes the uses of refrigeration, explains resistance to its application and gives some indication of its social impact. The importance attached to refrigeration in the lives of the American people is revealed in the statement that this is the only country where refrigeration is used extensively for domestic purpose.

The harvesting of ice in the early days, the invention of mechanical refrigeration, and the application of refrigeration to the various uses now so common to our civilization are thoroughly discussed and the far-reaching effects on various phases of American life are pointed out. The author, for instance, shows how improved methods of applying refrigeration in the food industries have been reflected in the betterment of the American diet, and touches on the remarkable expansion of non-food uses, such as the progress made in air conditioning.

In the application of refrigeration to the problems of a great industrial and agricultural nation, Americans, spurred on by the demands of climate, the vast distances between centers of production and consumption, and the requirements of industry, have held a position of world leadership. In no other country has refrigeration been used for purposes more varied or more significant.

It is interesting to note that prominently among the sources listed are trade and technical publications, including ICE AND REFRIGERATION. One brief critical note is that in the final chapter "Prospect and Retrospect" no mention is made of the accomplishments of The Refrigeration Research Foundation, although the Refrigeration Research Council, fore-runner of The Foundation is mentioned in the chapter on Distribution of Food (pages 257-8) and the Foundation is specifically mentioned in footnote on page 258.

The contents are exceptionally well documented. Copious f o o t n o t e s throughout keep the reader constantly informed as to sources and an inclusive index makes it useful for reference. The book is readable and informative and Mr. Anderson, who is a professor of history at the University of Cincinnati, has made a worth while contribution to the literature on the subject.

New Warehouse Addition

(Continued from page 20)

at once. Pallets are used on everything. Merchandise is stacked on pallets with a pattern allowing practically cold air circulation for each case.

Two cars can be unloaded at one time by using weatherproof hoods between the warehouse and car (see photo) the car temperature becoming the same as the warehouse while being unloaded. Pallet dollies are used in the car and loads rolled to the car door for the fork lift. A railroad siding runs along the rear of the building where cars are loaded and unloaded, and space for trucks is provided in front. Several trucks can be loaded or unloaded from the platform at once. Pallet dollies are also used in truck unloading and loading.

The company has plenty of room for plant expansion and when more space is required, it will be added. Headed by W. F. Asbury as president and F. E. Wills as secretary-treasurer and manager of cold storage, it is a subsidiary of The City Products Corp. of Chicago.

New Refrigerated Warehouse Built on Stilts

(Continued from page 33)

In its post-flood rebuilding program, the firm decided on construction of the large new warehouse, which is being developed into a food distribution center for the area. These facilities, and others salvaged after the flood, are now being offered food processors and distributors.

The new facilities are being assured of a source of power, even during an emergency, by a line being run across the Kaw river from the bluffs on the other side. The lowest storage floor is above the high water mark of 1951.

Midwest Cold Storage & Ice Corp. was founded in 1935 by W. Irving Moss & Associates. The firm is headed by W. Irving Moss, Jr., son of one of the founders.

TRRF Annual Report

(Continued from page 30)

in the major commodity fields, such as fruits and vegetables, poultry products, meats, dairy products, fisheries products, and the newer products that are coming to depend on low temperature for protection in storage. They were assisted by a number of the research project leaders and by members of the Board of Governors who represent the public interest.

Thus the group contributed to our understanding of that i m p o r t a n t question of the future and the trends that are under way, for future opportunities are largely measured by technological developments.

Practical Refrigerating Engineers Association

THE May 6th meeting of the Practical Refrigerating Engineers Association had a record attendance of more than 75 members and guests and was sponsored by the Arctic Engineering Corporation and Howe Ice Machine Company who had refreshments prior to the meeting.

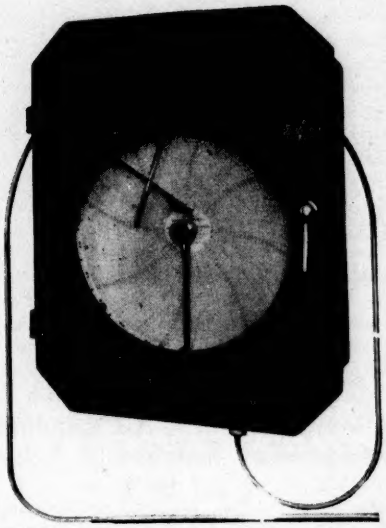
H. B. Howe and W. W. Morgan presented the topic "Gebhardt Dry Air Type Cooling Units" which described equipment for unit cooling. The subject was well received and many questions indicated a wide interest in this type of equipment.

Later there was a panel discussion consisting of H. M. Tombs, H. R. Halterman, W. H. Motz, Tony Vollman and Fred Loth. They discussed water and brine coolers.

More than 270 members and guests attended the Ladies Night Party on May 20 at Nielsen's Restaurant, Chicago. No business was discussed and the entire evening was devoted to f u n, entertainment and dancing which lasted until the early hours of the morning. A delightful dinner was served and everyone enjoyed themselves without incident.

Refrigerator Car Supply

REFRIGERATOR car requirements have been filled this winter with less stringencies than a year ago, notwithstanding the total refrigerator car ownership on January 1, 1953, was 1,346 cars less than it was on January 1, 1952. There is no surplus of cars and at present the supply is tight in Florida, the North Central Region, and the Pacific Northwest, according to a report by the Association of American Railroads.—Cold Facts.



Locker Room Story

TAYLOR'S Locker Room Recording Thermometer is on duty around the clock. It gives you an accurate, continuous report of the temperature inside your locker room, from a convenient point *outside* the room. You'll have a permanent, indelible, degree-by-degree, seven day temperature record from the instant the instrument is put in operation.

Here's protection for you, in the irrefutable evidence of temperature maintained, in case of damage claims: protection for your customers, who can assure themselves at a glance that their foods are kept safely.

Thanks to Taylor's exclusive Accuratus connecting tubing the instrument may be placed as far as 100 ft. away from the highly sensitive temperature bulb, without effect from varying temperatures through which the tubing passes. The case is moisture proof and corrosion resistant. 12" charts, graduated in degrees and hours, can be changed in a matter of seconds.

For full information on this and other Taylor refrigeration control systems, consult your Taylor Field Engineer, or write for **Catalog 300.** Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada.

Instruments for indicating, recording and controlling temperature, pressure, flow, liquid level, speed, density, load and humidity.

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French Study American Refrigerating Equipment

THE organization, administration, work methods and other factors responsible for high productivity in the American refrigerating equipment industry are being examined firsthand by French refrigeration specialists.

Sponsored by the Mutual Security Agency's productivity and technical assistance program, at the request of the French National Productivity Committee, the study is designed to promote increased production of refrigerating equipment in France.

Products of this industry contribute to the improvement of the French standard of living and effect France's economic strength. Increased production of more efficient, low-cost equipment, the productivity committee has pointed out, is expected to lead to better food storage and distribution methods by agricultural cooperatives, food wholesalers and retailers.

The French, who arrived in the United States on April 22, will make a survey of manufacturing techniques in the American refrigeration equipment industry. Their studies will include quality and cost control methods, standardization and simplification, mass production techniques, research facilities, merchandising, sales and service.

Their findings are to be made available to the French Refrigeration Manufacturers Association by means of reports disseminated by the French National Productivity Committee, as well as through articles in technical journals and meeting with various professional groups.

Mechanical Refrigeration For Motor Trucks

AN INTERIM report on test of a mechanical refrigerating unit designed to maintain low temperatures in motor truck transportation has been issued by the Production Marketing Administration of The United States Department of Agriculture. The report was prepared by Harold D. Johnson and C. Elliott Garver of the Marketing and Facilities Research Branch. Results of the test are summarized as follows:

Mechanical refrigerating units have been developed sufficiently to be used extensively in the protection of perishable agricultural commodities while being transported to market. This protection, however, has not met the requirements of some of the frozen products that are shipped over considerable distances in the present pattern of distributing our country's output of food.

This report covers a test on a relatively new type of mechanical refrigerating unit used in a truck carrying frozen turkeys from Modesto, Calif., to Medford, Mass. The average temperature of the cargo immediately after loading was minus 16 F. and just before unloading, minus 13.4 F. a rise of 2.6 F. Mechanical difficulty with a valve in the refrigerating system during the test caused a rise in average temperature of the load to minus 2.7 F. After the difficulty had been remedied, the system reduced the average temperature approximately 11 F. in the next four days, a rather remarkable performance for a motortruck refrigerating system.

Mechanical difficulty with the truck caused a considerable delay en route and the elapsed time between departure and destination was slightly more than 11 days. Outside temperatures during the trip were relatively low. Further tests should be made during extreme summer heat to determine the capabilities of the unit to maintain low temperatures. More uniform temperatures might be attained by increasing the clearance around and under the load.

REMA and ACRMA Merge to Form Air Conditioning and Refrigeration Institute

A PROPOSED merger of the Refrigeration Equipment Manufacturers Association (REMA) and the Air Conditioning and Refrigeration Machinery Association (ACRMA) was approved by the boards of directors of both associations at meetings held in Hot Springs, Virginia, on March 29, 1953.

George S. Jones, Jr., former vice president in charge of sales for Servel, Inc., will head the organization as managing director.

G. S. Jones

The new organization, to be known as the Air Conditioning and Refrigeration Institute (ARI) will be set up as rapidly as the merger can be consummated and details can be worked out.

Headquarters will be combined and remain in Washington.

In the meantime each association will maintain its own staff and continue "as is" with Jones directing their activities as soon as he has completed personal arrangements to take on the new assignment.

This assures the continuation of all activities now being carried on by each association with particular reference to the 8th All-Industry Refrigeration and Air Conditioning Exposition and should give the show increased importance.

Official approval of the merger by the members of both associations will be sought by mail ballot.

The combined membership will exceed 150 firms including practically all of the major companies in the industries.

Many advantages are to be seen in the merging of the two Associations. The purpose of the merger is:

1. To insure the continuance of the mechanical cooling industry as a prime industry entity.
2. To effect a cooperative interchange of commercial developments within the art of mechanical cooling for general industry progress.
3. To provide the means of employing prestige leadership and top-flight associations with management.
4. To provide such service facilities as may be necessary and to acquire the strength and prestige with which to attract new elements entering the industry.
5. To reduce the time burden on member representatives assigned to the administration of association affairs.
6. To eliminate costly and unnecessary duplication of effort and expense.
7. To gain recognition as the official voice of the mechanical cooling industry in all its relationships with other trade associations, the government, the press and the public.
8. To preserve a dues structure which will assure small companies a continuance of the benefits from basic service functions.

George S. Jones, newly appointed managing director, is well known in the refrigeration and air conditioning industry. He is a former president of the National Federation of Sales Executives and served as president of the Air Conditioning and Refrigeration Machinery Association in 1949. He has also been associated with and active in REMA. Previous to joining Servel, Inc., he was regional manager and later director of public utility sales for Frigidaire.

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Seventy years old in 1953, NATIONAL has been growing up with—and serving—the artificial ice and refrigeration field throughout its history of progress.

Long since, *NATIONAL Refrigeration Coils* became standard in the industry, and today a third generation of users is specifying NATIONAL for smoothness of bend, perfection of welding, and accuracy of measurement.

Whenever you need coils, write for our free tracing-chart which shows standard dimensions ready to fill in. It will simplify your specifications—whether for zig-zag or nested box or conical or round-flat or reducing coils.

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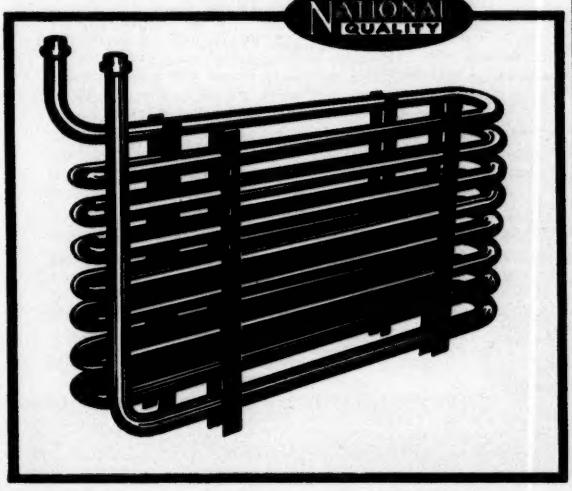

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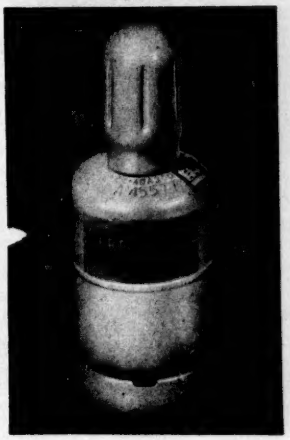

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YORK SUPER-REFINED REFRIGERATION OIL

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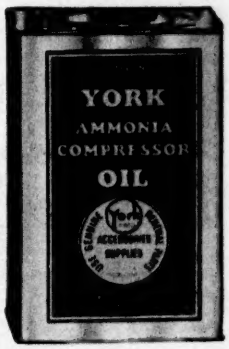
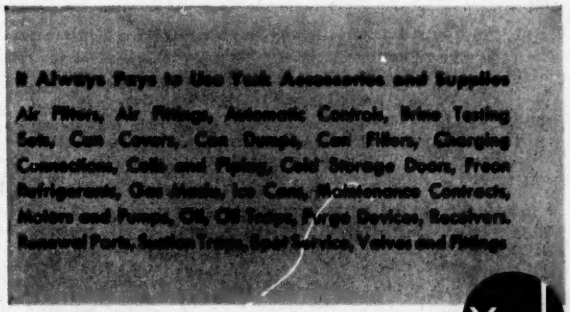
To get rid of damaging impurities, York refines its own oil!

Don't take chances with inferior oils. York oil gives you protection plus against parts and system failure.





YORK REFRIGERATION AND AIR CONDITIONING

HEADQUARTERS FOR MECHANICAL COOLING SINCE 1885

Refrigeration of Fish In Trawlers

THE refrigeration and storage of fish in trawlers, before being brought to shore after being caught, presents problems that have been the subject of much research. In a paper prepared for delivery at the annual meeting of the Engineering Institute of Canada by W. A. MacCallum, M.E.I.C., development engineer of the Halifax Atlantic Fisheries Experimental Station, a report was presented of the work in connection with this phase of commercial fishing carried on over the past six years.

Experimental construction has been carried out on four boats, two fishing schooners and two trawlers, while observations have been made on these and on about a dozen other trawlers. Different types of insulation and jacketing were used in the fish holds and their performances studied.

A jacketed design, together with special attention to the icing was found to give good results. Due to the desire on the part of the skippers to make certain that no fish were lost while the crews were becoming familiar with the amount of ice necessary for proper handling of the fish in these fish holds, more ice was used during the first summer of operation than was needed to satisfy theoretical requirements. However, it was estimated that each boat used about 48 percent less ice than would have been required for equivalent icing results on an uninsulated, non-refrigerated craft having the same size hold.

Electric power requirements and costs will form the major stumbling blocks in the way of mechanical refrigeration for boats already in use. With about 10 Kilowatts needed for refrigeration services, extra installations will have to be set up at a cost which can be borne by the boat and in space that will not interfere with normal operations.

"Future plans could be profitably directed to the construction of 'unit' pens of solid metal components," said Mr. MacCallum in his paper. "It would seem definitely worthwhile to build and to test this type of pen in actual fishing operations.

"Pen shells of heavy metal sheet construction could be utilized in the fish hold. These pens could be made in the shop in two sections which could be assembled with bolts aboard ship. In essence, each pen when in place is a large metal box, appropriately shelved, and supported away from the ship's 'ceiling' and deck, and watertight as far as leakage through pen sides and backs is concerned.

CONVENTION CALENDAR

CANADIAN ASSOCIATION OF ICE INDUSTRIES
November 2-5; 1953
Seigniory Club, Montabello, Quebec
MILDRED E. CROFT, Secy-Treas.

NATIONAL ASSOCIATION PRACTICAL REFRIGERATING ENGINEERS
November 11-13, 1953
Purdue University, Lafayette, Ind.
J. RICHARD KELAHAN, Secretary

NATIONAL ASSOCIATION OF ICE INDUSTRIES
November 17-20, 1953
Hotel Statler, Washington, D.C.
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ASSOCIATION DIRECTORY

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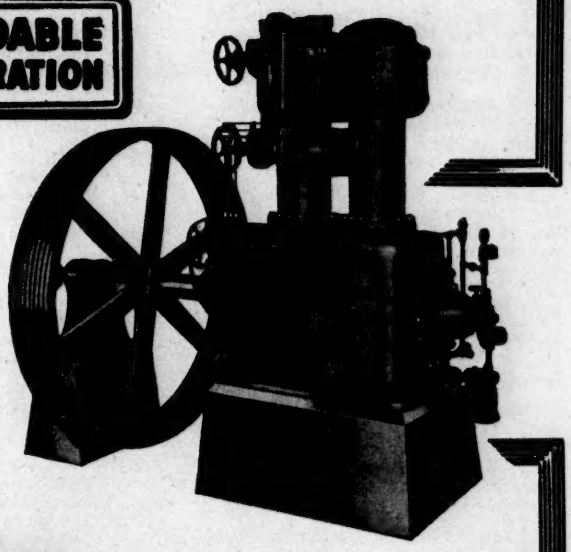
Sterling DEPENDABLE REFRIGERATION



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PRINCIPLES of REFRIGERATION

The Book for:

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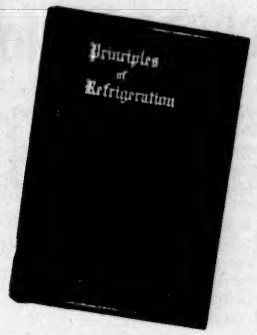

PRINCIPLES OF REFRIGERATION, 3rd Edition (1947) revised by Wm. H. Motz, provides information and data for the practicing refrigeration engineer. Of special interest to erecting and operating refrigerating engineers, refrigeration machinery sales engineers, persons employed in building refrigerating machinery and those employed in ice making, cold storage plants or other establishments equipped with refrigerating machinery. Contains information that the refrigerating engineer should know in order that he may have complete and up-to-date knowledge.

Written in every day language and as free as possible from higher mathematics. The theoretical and fundamental operating principles are given attention first—followed by numerous practical considerations and the application of principles to the economic production of ice and refrigeration for various purposes.

672 Pages—215 Illustrations—9 Folded in charts—6 Working charts in Cover Pocket. Substantially bound.

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NOBODY likes hand purging. It is a messy, smelly, time-consuming job.

But purging doesn't have to be a disagreeable task—not when an Armstrong purger does it for you:

SAVES MANUAL PURGING TIME: Time otherwise wasted on hand purging is saved for other duties.

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ELIMINATES EXCUSES FOR NOT PURGING: Purging is so easy with an Armstrong purger that there is no reason for postponing the job.

For full details on Armstrong Purging, ask for FREE BULLETIN No. 221.

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New Plants and Improvements

Corona, Calif. — Construction has started on a new $450,000 refrigerated warehouse for juice products by The Exchange Lemon Products Company.

Los Angeles, Calif. — A new $600,000 cold storage plant has been completed at 2851 East 44th Street by Pacific Cold Storage Inc.

Marysville, Kan. — New ice making equipment has been installed in the Marysville ice plant, replacing equipment that was in use for about 45 years.

Houghton, Mich. — The Capital Outlay State Committee has passed an appropriation for $169,000 for an ice plant at the James R. Dee Stadium.

Paw Paw, Mich. — An 80 x 100 foot cold storage plant is being installed by the Paw Paw Grape Juice Company to house enough stainless steel tanks to store 400,000 gallons of grape juice.

Omaha, Neb. — The Omaha Cold Storage Company has started construction of a new office building to cost about $80,000. Some space will be provided for car and truck parking.

Rochester, N. Y. — A three-year improvement program was completed when Rochester Ice Inc. moved into a new office at 10 Moore Street. The consolidation of the bottling plant, garage, office and ice plant will improve service to customers, according to Wm. J. Lewis, president.

Rochester, N. Y. — Seneca Frosted Foods will move its Brockport plant to Rochester after purchase of a building from Rochester Ice Co. for $45,000. Seneca Frosted Foods operates several plants in New York State.

Pittsburgh, Pa. — The Rieck Ice Cream Company division of National Dairy Products Corp. has opened a new four-million gallons-per-year ice cream plant in a Pittsburgh suburb.

Memphis, Tenn. — The Tennessee Quick Freeze & Storage Corp. will more than double its present storage capacity with construction of a new quick freeze warehouse. The building will cost approximately $200,000.

Sales and Reorganizations

Los Angeles, Calif. — A syndicate headed by Louis Cesaretti has bought the National Ice & Cold Storage Company plant at 210 Center Street, Cesaretti said there will be no change in management, personnel or method of operation. The new ownership took effect May 30 under the name of National Storage Company.

Los Angeles, Calif. — The Cudahy Packing plant at 808 E. Macy St., has been purchased by a syndicate headed by Gerald Dunitz and Jack Albert. The transaction involved an amount well in excess of one million dollars. The purchasers plan to remodel the buildings to be leased for dry and refrigerated storage.

Bethany, Mo. — The Bethany Ice Plant has been leased for the season by I. H. Denison of Tindall.

DEATHS

James J. Gallagher

THE death of James J. Gallagher, retired superintendent of the Merchants Refrigerator Co. plant at 384 Warren St., Jersey City, occurred May 26 at his home, 640-36th St., Union City. Mr. Gallagher was formerly supervisor of the Merchants firm's refrigerating warehouse in several eastern states. He was with the concern 46 years. He was a World War I veteran having served in France with the United States Army.

PAUL J. RICH, chairman of the board of Rich Ice Cream Co. Inc., Buffalo, N. Y. and a pioneer in commercial production of ice cream in this country, died May 22 at the age of 72. He founded the company in 1910 and built it into one of the largest independent ice cream plants.

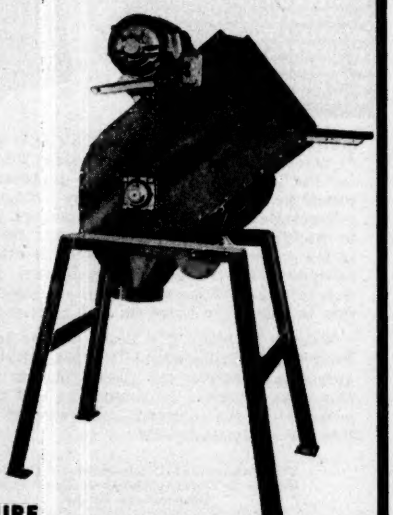
TWO NEW ALL-STEEL ICE CRUSHERS by BATEMAN

Regal MODEL 25

The New REGAL Model 25 has all steel frame legs, grate handle and grate. Self-aligning ball bearings. Legs high enough for 25-lb. paper bag to be filled. Galvanized for the prevention of rust. ¾ HP. motor. Direct drive, no gears. Shelf for placing ice on before entering hopper. Slanting hopper for easy loading. Four grate adjustments by turning the handle on side of crusher. Makes a very good fine ice on grate closed. Will take long 50-lb. blocks in hopper. Two belts for sure pulling power. Belts and motor pulley furnished when crusher is ordered without motor. Delivery can be made on receipt of order. Guard covers the flywheel and motor pulley.

Price $149.00, less motor. Motor at prevailing price.

Monarch MODEL 50



The Bateman all steel MONARCH Model 50 Ice Crusher is galvanized for the prevention of rust. Slanting hopper for easy loading, with shelf for placing ice on before entering crusher. Hopper opening—12½"x15". Uses 1 HP. motor with V-belt drive. All moving parts move on either ball or roller bearings. Gears are of alloy steel hardened for long life and trouble free. Steel shell, legs, grates, grate handle and alloy steel teeth. Belts and pulley furnished when crusher is ordered without motor. Side plates and bottom of hopper 3/16" steel.

Price $235.00, less motor. Motor at prevailing price.

WRITE FOR DESCRIPTIVE LITERATURE

Bateman ICE PROCESSING EQUIPMENT MINERAL WELLS TEXAS

Mr. A. Gordon Janney (left), President of The Baltimore Cold Storage Company, discussing installation of corkboard insulation with Mr. W. S. Woodside, Baltimore District Manager of United Cork Companies

FROZEN FOODS STORAGE PLANT EXPANDS USE OF CORKBOARD

First installation of United Cork Companies' BB (Block-Baked) Corkboard at the plant of The Baltimore Cold Storage Company was made because Mr. A. Gordon Janney, President of the company, regarded corkboard as both the most economical and the most efficient type of low-temperature insulation.

This installation, made in 1947 in a room used for storage of frozen foods at a temperature of 5° below zero F., was designed by United's Engineering Service, in cooperation with Mr. Van Rensselaer H. Greene, Consulting Engineer for the Baltimore Cold Storage Company.

Two layers of 3" BB Corkboard were used. The first was erected against brick in a bedding of Enamelite, and the second against the first—also in Enamelite.

The entire installation was made by United Cork Companies' own skilled erectors, working under the supervision of the Baltimore Division. An interesting feature of the installation is that all work was done while a temperature of 5° below zero F. was being maintained in the room.

Results Lead to Re-orders

The Baltimore Cold Storage Co.'s experience with BB Corkboard was so successful that the company has since made new installations to convert three floors from cooler to freezer use.

A major factor in the effectiveness of United's BB Corkboard, in the opinion of Mr. Janney and thousands of other satisfied users, is the unified responsibility for the entire job. United Cork Companies select the grade of cork and bake the granules into BB Corkboard by a patented process. Engineers at United's branch offices throughout the country design the installation, and erection work is done by United's own skilled erectors under the supervision of the local Division Manager.

For more information about United Cork Companies' services and installations, drop a line to United Cork Companies, Dept. I-6, Kearny, N. J.

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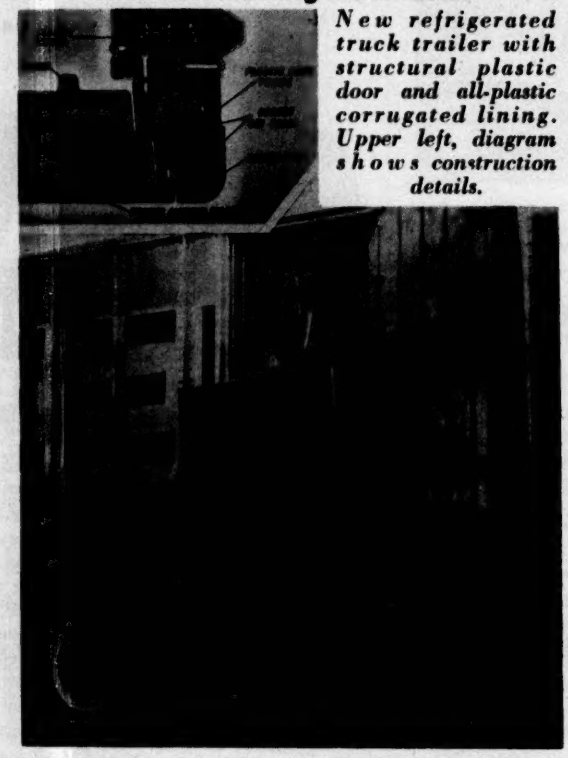
What's New

MACHINERY APPLIANCES • PROCESSES

Plastic Fitted Trailer For Hauling Perishables



New refrigerated truck trailer with structural plastic door and all-plastic corrugated lining. Upper left, diagram shows construction details.

A refrigerated truck trailer with a new structural plastic door and an all-plastic corrugated lining has been developed by Strick Company, Philadelphia, with test results that the manufacturer hails as a big improvement in refrigeration of over-the-road cargo.

In extensive trial runs during the past twelve months according to the manufacturer the trailer with plastic doors and liner has proven 25 percent more efficient than wood and metal refrigerated trailer structure and is able to maintain operating temperatures with the refrigerating equipment running only 75 percent of the time formerly required.

The new reinforced plastic is 40 percent lighter than aluminum. The weight-saving over the conventional design increases by up to 1,000 pounds the weight of load that can be carried.

Among other features the plastic material it is said does not absorb or transfer odors. Its moisture absorption is negligible. The material is inherently rot-proof, vermin-proof and because of corrosion resistance will not stain or discolor meat or other critical cargoes. The plywood interior walls have been replaced with corrugated sheets of polyester fiber glass laminate.

The plastic liner can be quickly and thoroughly cleaned. It will not develop cracks or collect moisture or dirt. Its sanitary advantages are obvious. In the new design the usual heavy oak cargo spacers have been eliminated and to provide the necessary cold air circulation around the load, vertical corrugations have been molded into the plastic liner.

The one piece molded door is shrink-proof and will not deform or sag. The cargo spacers are integrally molded in the plastic door shell. The plastic material is in itself an insulator and when combined with plastic framing members eliminates heat losses caused by heavy wood sections or direct metal-to-metal contact.

Line of Chemical Dehumidifiers Expanded

TO meet the increasing demands of industrial processors for continuous production in operations involving the use of air at sub-freezing temperatures, the Kathabar Division of Surface Combustion Corporation, Toledo, Ohio, has extended its line of low temperature units to handle up to 17,000 cfm in individual units.

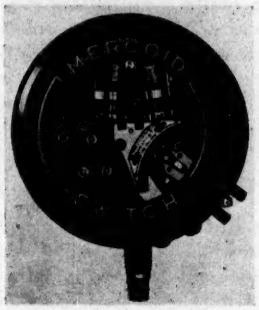
Requirements for air at sub-freezing temperatures, down to —100F, are found in the confectionery, pharmaceutical, brewery, aircraft, meat, plastic, food and other industries. Previous to the development of these units, air at these low temperatures could only be supplied with straight refrigeration equipment subject to periodic shut-down for defrosting. The efficiency of those operations was also impaired because of the insulating effect and air throttling action of frost formation.

These Kathabar units will also deliver air at 25 to 30F lower dewpoint than the dry bulb temperature of the air. In many cases this characteristic eliminates the necessity of cooling the air to the required dewpoint temperature. Since the dewpoint may be 25 to 30F lower than the dry bulb temperature required, substantial refrigeration savings are afforded.

The Kathabar Low Temperature units, modifications of conventional units for obtaining low absolute humidities, are provided with increased air-moisture-absorbing capacity through the use of refrigerants, such as brine, methanol, ammonia, Freon and chilled water, in the cooling coils. Low dewpoint, sub-freezing air is supplied continuously and automatically to process areas without frost formation.

New Pressure Controls

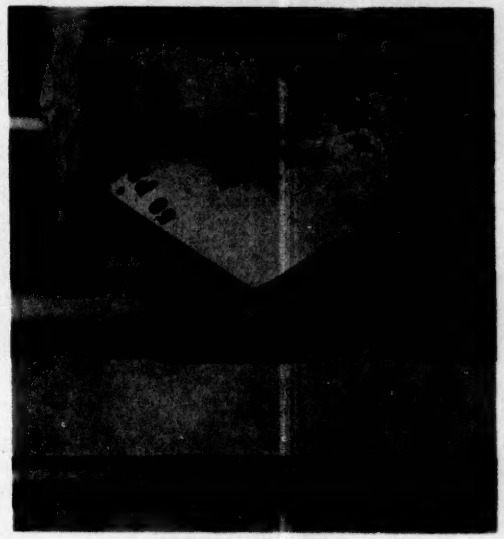
A NEW Mercoid control incorporates a single bourbon tube which actuates two independently adjustable magnet operated mercury switches. A calibrated dial with two outside adjustments is provided for setting pressures at which each switch operates. Upper pointer indicates operating point of the high pressure circuit and lower pointer indicates operating point of low pressure circuit. The pressure represented by difference between two pointers indicates pressure change between operation of switches. Following are some suggested applications: Close one alarm circuit at high pressure and another at low pressure with both circuits open over operating range. As electrical interlock to open one circuit as pressure rises.



New Mercoid Pressure Control

Vinylite Plastic For Pipe Identification

AN easily installed pipe identification system that requires no protective coating, has been announced by Bakelite Company, a division of Union Carbide and Carbon Co. The system it is stated, requires no cleaning or maintenance and uses labels custom-made of vinylite plastic rigid sheet. Corrosive conditions, temperature and humidity changes to which pipe labels are usually subjected have little effect on Vinylite plastic rigid sheet, which resists moisture, oils, greases, acids, alkalies and most other chemicals. The rolled label is spread by hand and allowed to spring closed around the pipe. Colored and worded to fit the exact requirements, the label fits any size pipe up to 30 inches in diameter and is easy to read at a distance and from any angle.

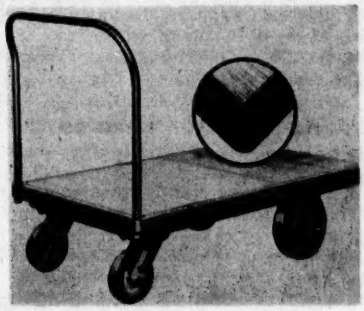


Showing application of Vinylite pipe identification

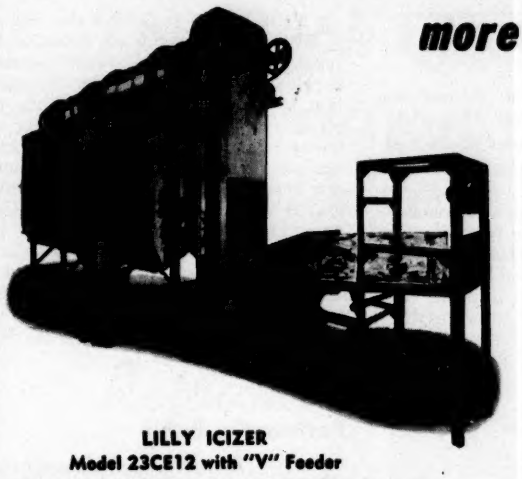
Vinylite plastic it is claimed, also withstands rough handling, resists warping and aging and does not support combustion. This durability gives the new type labels long service life which eliminates the need for frequent and costly replacement. Use of these pipe labels helps speed up repairs, promotes safety, aids in personnel training and eliminates loss of time spent searching for specific pipes or valves. Available in 6, 8, 10 and 12 inches in length to fit any size pipe up to 30 inches in diameter.

New Heavy Duty Floor Trucks

A LOW cost, heavy duty model truck has been announced by the All Steel Welded Truck Co., Rockford, Ill. Model CB is made with two complete arc-welded steel frames without any bolts or loose joints, and has rounded corners for safety. The flush-mounted renewable deck is sandwiched between the frames and protected by a minimum of six and



All Steel Welded Floor Truck



LILLY ICIZER
Model 23CE12 with "V" Feeder

This Model ICIZER will size 25-35 tons per hour. Lilly "V" Feeder shown feeds full blocks into breaker.

Other models for large and small plants.

more profits this summer

with a LILLY ICIZER

Sized ice is your biggest money maker . . . and a Lilly Ice Sizing unit is your best bet for easier, more economical, trouble-free production. Lilly Icizers offer superior advantages throughout, with—

- Precision Adjustable Breaker
- Bucket type elevator—no scraping or grinding of ice
- Rubber wheel sanitary screen drive
- Positive Feed spiral screens
- Bag height bins—faster filling

—and there's a standard model Lilly Ice Sizer for every size plant.

Boost your profits this summer. Write today for Lilly Catalog No. 303 and get full details on Lilly Sizing and crushing equipment. *No obligation.*

Package Your Ice in
LILLY PAPER BAGS
Write for new lower prices

THE LILLY COMPANY

SUPPLIES — EQUIPMENT
- Bags—Tongs
- Ice Sizers
- Tank Supplies
- Crushers

A complete line of supplies and equipment for the ice industry.

as many as eight cross-members per truck. The smoothly rounded uniweld stake pockets, of steel integrally welded into the truck, prevent injury to personnel, or material carried such as cardboard boxes, clothes, paper bags, and other items subject to damage from sharp-corners.

The complete line of trucks has been designed for low-cost production and is equipped with Clark fabricated casters and wheels. A choice of tilt and nontilt types is offered as well as a choice of wheels of steel, rubber, composition, oil-resistant, and static-conductive in all sizes. Further choice includes Hyatt type straight roller bearings, ball bearings, and tapered roller bearings, with seals if desired. These new trucks are available in capacities up to 7000 lbs. Standard sizes are 24, 30, 36, 42 or 48 inches in width, and 48, 54, 60, 66 or 72 inches long. Other sizes on application.

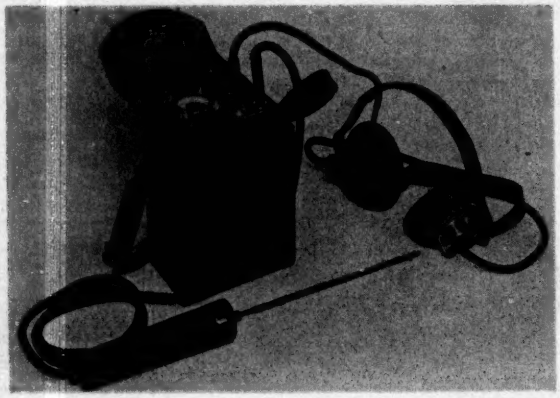
Sound Detector Locates Mechanical Troubles

AS a practical help in maintenance, testing and inspection, Anco Instrument Division, Chicago, has introduced a new audio-video model of the Elec-Detec, portable electronic instrument designed for locating noise sources in all types of mechanical equipment.

According to the announcement, the unit, known as Elec-Detec Model V includes a milliammeter for checking sound impulses visually, in addition to the standard headphones for audible operation. The combination, it is stated, enables the operator to "see as well as hear" the location of the source of trouble in bearings, pistons, gears, ratchets, cams, clutches and other moving parts.

The accurate performance of the new video unit, it is claimed, is assured by the use of a highly stable germanium crystal diode in the circuit. This crystal serves to rectify the current to record the electrical impulses accurately on the d c milliammeter, and to provide the wide frequency response required, it is pointed out.

Full details can be obtained from Anco Instrument Division, American Name Plate & Mfg. Co., 4254 W. Arthington Street, Chicago 24, Ill.

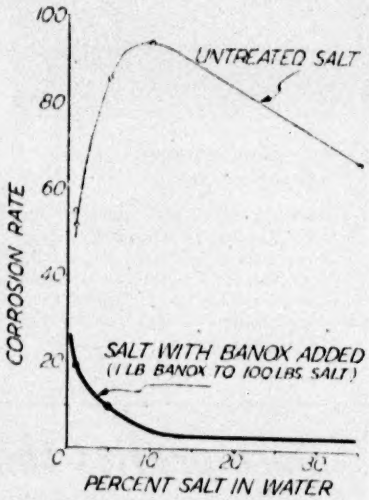


New Audio-Video Model V of Elec-Detec

Rust Inhibitor for Brine Refrigeration System

CORROSION or rust in a salt brine refrigeration system is a recognized common cause of clogged spray nozzles, extra maintenance and cleaning expense, shortened equipment life, contaminated brine, and spotting of meats or other refrigerated product.

A new method of controlling corrosion and rust in such facilities; unit coolers, cold air diffusers, spray deck refrigeration systems, is being announced by Calgon, Inc., Pittsburgh. Use of the company's rust inhibitor "Banox" in meat packing plants, dairies, breweries, cold storage plants and refrigeration brine systems elsewhere has indicated that it effectively stops rust action.



This chart shows that Banox reduces corrosion of salt brines by 80 to 90 percent; makes them less corrosive than ordinary tap water.

Calgon, Inc., spokesmen announced that the use of Banox in refrigeration salt brines in federally inspected meat packing plants is approved by the Meat Inspection Service of the U. S. Bureau of Animal Industry. They point out that Banox contains no chromates, alkalies or acids and is odorless, non-poisonous and non-toxic. It has proved harmless to the skin, eyes, clothing, paper and paint finishes.

The rust inhibitor, in dry powder form, is added with the salt cubes, granulated salt or rock salt in a proportion of one pound Banox to 100 pounds salt, when the refrigeration brine is prepared. For each 50-pound salt cube added to pan or spray deck to maintain strength of brine, one-half pound of Banox is sprinkled into the brine. If granulated salt is used, one pound of Banox is sprinkled into the brine for every 100-pound bag of salt added. If a rock salt dissolver is used, Banox may be rough-mixed with the salt in this recommended proportion before loading the dissolver or storage hopper, or the equivalent amount may be sprinkled into the refrigeration brine system each time saturated brine is added.

Banox dissolves in the water along with the salt, and seeks out all metal and oxide surfaces. It coats them with a microscopically thin complex phosphate coating which seals out oxygen and protects the metal from corrosion, the Calgon, Inc., announcement explains.

Details on this use of Banox are contained in a new folder, "Refrigeration Salt Brine Corrosion Control with Banox," available without obligation upon request to Calgon, Inc., Hagan Building, Pittsburgh 30, Pa.

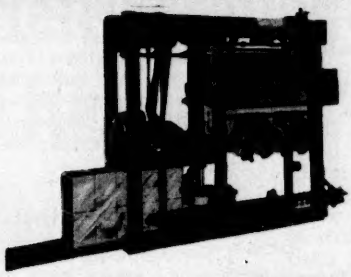
Dry-Ice Bunkers for Truck Refrigeration

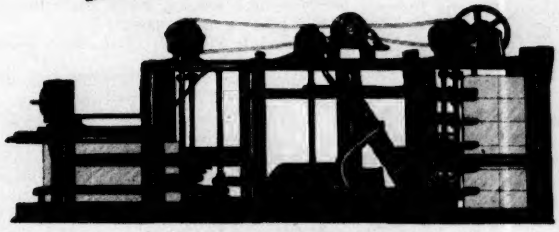
A NEW 6-page folder on the use of blower type dry-ice bunkers in truck refrigeration has been released by Foster-Built Bunkers, Inc. In addition to showing the complete line of bunkers, this new folder gives data on the number of units required for various size trucks, typical installations, and actual case histories of the bunkers in operation on test loads. The units range in price from $65.00 to $87.50 and models are available for all size trucks. Copies of the folder and complete price information may be obtained by writing to the manufacturer Foster-Built Bunkers, Inc., at 757 W. Polk Street, Chicago 7.

Permamix Patch

A PERMANENT repair on concrete brick tile or asphalt floor surfaces is available with the use of Permamix, manufactured by the Permamix Corp., Chicago, Ill. It is long wearing, easy to apply, sets instantly, will not freeze, can be stored indefinitely and used in any temperature. Application details are fairly simple, merely cleaning the area to be patched, apply primer supplied in drum and fill with Permamix just as it comes from the package, allowing sufficient material for a slight crown, then tamp solidly. It comes in 50 lb. net weight fibre drums.

★ Perfection A MODEL FOR EVERY REQUIREMENT ★





PERFECTION-MADE MILLER

Illustrated at left is the 300 pound MILLER model which scores over 50 tons per hour . . . also available is a 400 pound model scoring 65 tons per hour. Only one operation is necessary for complete scoring. The MILLER is the lowest priced heavy duty Scoring Machine on the market today.

PERFECTION SPECIAL

The PERFECTION SPECIAL receives ice blocks on edge, scores them lengthwise first. Then heads up the blocks, scores them crosswise and discharges them standing on end. This is a combined heading and scoring machine and scores the blocks into any size pieces desired in one complete operation. Capacity is 4½ blocks per minute or 270 blocks per hour.

QUICK DELIVERY!

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The Book of Refrigeration Knowledge

Basic Refrigeration

PRINCIPLES
PRACTICE
OPERATION

By GUY R. KING
Refrigeration Instructor
Santa Monica Vocational School

THE 29 chapters of this 500-page book contain a complete and simplified presentation of the fundamentals of refrigeration, giving equal treatment to all common refrigerants, design, operation and servicing of the apparatus and systems.

The author has drawn on a wide and varied experience in the practical aspects of refrigeration, coupled with many years of teaching the subject. BASIC REFRIGERATION is written in non-technical language and the author has recognized the requirements of the refrigeration engineer, installer, salesman, student and instructor, compiling the text in a manner which progressively treats the subject from fundamentals to complete systems.

The text is supplemented by an unusually large number of excellent illustrations, (348). All basic points are graphically illustrated in a way that creates additional interest for the reader and assists him to gain a full understanding.

Numerous example problems are given along with a step by step solution. Each chapter is followed by a good group of questions.

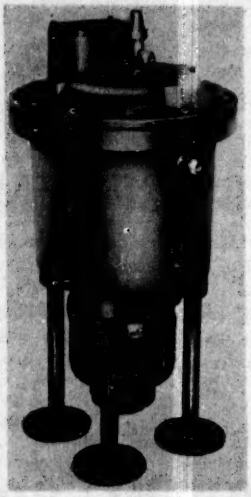
$6.00 POST PAID

NICKERSON & COLLINS CO.
433 N. Waller Ave., Chicago 44, Ill.

MANUFACTURERS' NEWS

Hermetic Refrigerant Pump

THIS hermetically sealed pump is designed to handle the Freon refrigerants in their liquid state. It is being applied to many refrigeration recirculating systems to increase efficiency and simplify controls. It is particularly effective on low temperature and ultra-low temperature Freon refrigeration systems.



New hermetically sealed pump

Single and multiple evaporators may be handled under varying head and flow conditions. A patented oil return feature automatically holds oil concentration in evaporators to a minimum. Eight sizes are available ranging from 4 to 40 GPM against heads up to 50 pounds per square inch with motors from ¾ to 3 hp.

These pumps are now available to the trade from Heatron, Inc. who has recently been licensed to manufacture under patents. A four-page bulletin with line application drawings, dimensions and additional data is available from the manufacturer.

New Trane Products

NEW products introduced by Trane Co. in the past three years will account for more than one-third of its 1953 sales. These products include a wide range of refrigeration machines, water chillers and self-contained air conditioners. Order backlog is presently 33 percent higher than a year ago, according to company reports.

Conversion Tables

A HANDY 2 x 6 inch plastic pocket-card imprinted with frequently used altitude and refrigeration conversion tables is offered designers and refrigeration engineers by Tenney Engineering Company, Newark, N. J. A table converts altitude to pressure in inches of mercury and another gives pressures of Freon.

Predicts Growing Sales of Home Air Conditioning

TOTAL 1953 retail sales of the air conditioning industry may well approach the $2 billion mark, Cloud Wampler, president of Carrier Corporation, said in an address to the Cleveland Society of Security Analysts. He pointed out that this would mark an increase of more than 50 per cent over the estimated retail volume of $1¼ billion for the industry in 1952. Last year, in turn, showed a gain of 25 per cent over the $1 billion retail sales figure for the year 1951, he said.

Mr. Wampler explained that the figures presented include all types of air conditioning equipment, for plants, office buildings, hotels, apartment houses, stores and homes, as well as room air conditioners, plus the cost of installation.

"The greatest growth potential in the field is the year-round air conditioning of residences, with systems for industrial plants being a close second in importance," he said. "Entirely too much emphasis is today being placed on room air conditioners as making up the bulk of the industry's potential. I am sure that year-round units for homes will rapidly overtake room air conditioners in dollar volume. And the broad base of the business, so-called big installations, is continuing to expand at a highly satisfactory rate.

"Over the years I do not expect room air conditioners to account for more than 10 to 20 per cent of the industry's total volume. On the other hand, year-round air conditioning for homes should, within the next ten years, become the greatest single part of the business, amounting to about 35 per cent of total industry sales."

Johns-Manville Appoints Construction Managers

CONTINUED growth of Johns-Manville's contract industrial insulation business has led to the appointment of six Regional Construction Managers in strategic areas throughout the country, it was announced by D. D. Crews, Johns-Manville manager for construction.

New Regional Construction Managers appointed are: W. H. G. Murray, New York Region, Syracuse, N. Y.; V. D. Suiter, Philadelphia Region; James Collins, Cleveland Region; H. P. Barnes, St. Louis Region; W. F. Quinby, Houston Region; and J. B. Jobe, Los Angeles Region. G. L. Maw has been named Assistant Cleveland Region Construction Manager with headquarters in Detroit.

The regional posts were created, Mr. Crews said, to handle the increased demand for Johns-Manville commercial and industrial insulations and to meet the need for special technical skills required in the installation and application of the insulations.

New Vending Installations

THE following companies, during recent weeks, have installed S & S Vending equipment:

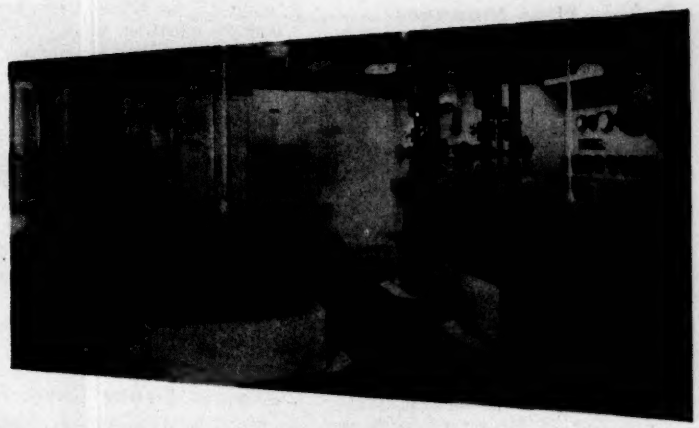
Senders Ice & Coal Co., Huron, Ohio.
Whitaker & Sons, Millville, N. J.
Victor Supply Co., Homewood, Ill.
City Products Corp., Chicago, Ill.
Crystal Ice Co., Ardmore, Okla.
Tulare Klear Ice Co., Tulare, Calif.
Maddox Ice Co., Denver, Colo.
Diamond Ice Co., Wilmington
Duval Ice & Coal Co., Jacksonville, Fla.
Interstate Ice Co., Indianapolis, Ind.
Horry Ice Co., Myrtle Beach, So. Carolina.
City Ice Co., Huntsville, Ala.
Crystal Ice Co., Norwalk, Conn.
Vigo Ice & Cold Storage Co., Terre Haute, Ind.
American Service Co., High Point, N. C.
Locust Lane Dairy, Moorestown, N. J.
Jack's Service Station, New Haven, Ind.
Jensen Ice Co., Ogden, Utah.
Artificial Ice Co., Billings, Montana.
O. A. Logue, Terre Haute, Ind.
Thorsby Ice Co., Thorsby, Ala.
City Products Corp. St. Bernard, Ohio.
Coca Cola Bottling Co., Kingman, Arizona.
West Salem Ice & Coal Co., West Salem, Ill.
Moore Ice Co., Salt Lake City, Utah.
Ebner Ice & Cold Storage Co., Martinsville, Indiana.
Pearl Packing Co., Madison, Indiana.

Canadian Company to Sell Carpenter Skating Rinks

E. J. WRIGHT Utilities Limited of Strathroy, Ontario, has completed arrangements with E. R. Carpenter of Cleveland, Ohio, for exclusive right to sell the Carpenter Monolithic Floating Floor and piping system for ice skating rinks in Canada. Complete engineering of the Carpenter structure will be provided along with the invention and floor equipment. Roger Sprague, formerly with Baker Refrigeration Company, South Windham, Maine, is chief engineer of E. J. Wright Utilities Limited, founded in 1865. The first Carpenter Monolithic floating floor at Rye, N. Y., now in its twenty-fourth year continues to give good service.

Multiply Refrigeration Efficiency

by ÷ Dividing the Refrigeration Load with a CP BOOSTER SYSTEM



CP Booster System at storage plant of Golden State Co. Ltd., in San Francisco provides efficient refrigeration for 10 huge freezer and chill rooms.

Actually Holds Temperatures as Low as -60 F. with LESS HORSEPOWER LESS SPACE LESS WEAR LESS MAINTENANCE

Wherever temperatures are 0°F. or lower, CP Multi-Cylinder Booster Systems offer decisive advantages.

With CP Type "K" Boosters and 2nd stage Compressors, both units work within their most efficient range. Compression ratios are lower; the 2nd stage compressor runs cooler, under easier load. Units last longer, horsepower requirements are reduced.

You'll get the benefit of all of CP's experience in this new, cost-cutting refrigeration development when you specify CP Type "K" Boosters and Compressors for your refrigeration system. Send for information.

THE Creamery Package MFG. COMPANY

General and Export Offices: 1243 W. Washington Blvd., Chicago 7, Illinois

Creamery Package Mfg. Co. of Canada, Ltd.—Toronto

New DRY TAMP PERMAMix Floor Patch

Permamix-C for patching in temperatures from 5° above to 30° below zero.

DRY TAMP MEANS SPEED • No sticky mass to dig out of the drum or to handle • Permamix dry pours • sets instantly • feather edges perfectly • no production delays • non-skid surface.

ALL TEMPERATURE • Won't freeze • can be stored or used in *any* temperature • will store indefinitely • a stock room item • will not "set" in drum whether open or covered. Mistakes just can't happen. Tamp in place and traffic rolls.

CUTS MAINTENANCE COSTS on concrete, brick, tile or asphalt floors • no special equipment or skill needed • a one man job • comes in durable 50 lb. net wt. fibre drums • solve your floor patching problems for good.

Write for Details Now!

PERMAMIX CORPORATION

220 N. LA SALLE STREET CHICAGO 1, ILLINOIS

Mr. Ice Manufacturer...

INCREASE YOUR ICE TONNAGE!

SELL SNO-MASTER Sanitary Ice Shavers!

SNO-MASTER snow-ball and sno-cone making machines have increased the ICE TONNAGE wherever they have been introduced! If you sell equipment we will be glad to send you a SNO-MASTER machine on MEMO to put out for FREE TRIALS! Find out what SNO-MASTER can do to help increase YOUR ice tonnage! Write for complete details!

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124 Hopkins Place, Balto 1, Md.
Gentlemen:
Please send me details on SNO-MASTER!
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Address: .....
City ..... St. .....

SNO-MASTER Mfg. Co.

124 Hopkins Place • Baltimore 1, Md.

Dubois New Manager CP Denver Branch

THE appointment of Charles Dubois as manager of The Creamery Package Mfg. Company's Denver branch has been announced by J. L. Brazee, CP vice-president in charge of sales.

Mr. Dubois received his B. S. Degree in Dairy Manufacturing from Washington State College and furthered his educational background with a Master's Degree from Kansas State. His experience in industry includes field work, plant management, and later supervision of Sanitation at Albuquerque, New Mexico. During World War II he served with the United States Navy as a communication's officer.

He started with Creamery Package in 1945 as a sales engineer for its Seattle Branch. He was promoted to manager of the CP Salt Lake City Branch in July 1949. Early in May 1953, he was appointed manager of the Creamery Package Denver Branch.

A recent announcement by J. L. Brazee, vice-president, The Creamery Package Mfg. Company, states that Blaine Anderson has been promoted to manager of CP's Salt Lake City Branch.

Mr. Anderson was raised on a dairy farm in Provo, Utah. After attending Utah State Agriculture College he went to work for a subsidiary of Pet Milk Company (Cloverleaf Dairy and Colville Ice Cream Company) in Salt Lake City, spending five years as Plant Superintendent at Colville Ice Cream Company. Later, he became a salesman for Waratek Chemical Company in Salt Lake City and early in 1950 joined Creamery Package in a sales capacity where he attained the position of assistant sales manager, a post he continued to hold until his recent appointment.

General Ozone Corp. Moves

THE General Ozone Corporation and its associates announce a change in their address. Previously located at 1455 W. Congress Street, Chicago, for the past 33 years, the plant and offices have been moved to the new location at 315 N. Aberdeen Street, Chicago, Ill. The desire to expand their laboratories and research departments were primary factors in making the change. At the new location greatly expanded facilities are available for all phases of their services to their customers. They will continue to manufacture all types of ozone equipment as well as service and repair existing installations.

Symposium on Insulation

A SYMPOSIUM on Cold Storage Insulation for the meat and food industry in the Chicago area, was conducted by the Owens Corning Fiberglas Corp. at the Stock Yards Inn luncheon on February 19. This two-hour discussion and demonstration covered new developments in the cold storage industry in equipment, refrigeration and insulation materials; advantages offered by the new developments; and motion pictures of the recent major warehouses constructed throughout the United States, showing actual steps in the construction. Shown were Pasco Packing Company, plant at Dade City, Florida; Minute Maide Freezer Corp. at Leesburg, Fla.; Mid-South Refrigerated Warehouse, Memphis, Tenn.; U. S. Army Quartermaster Depot, Alameda, Calif., and Port of Tacoma Refrigerated Warehouse.

Guests in attendance were engineer staffs from Agar Packing & Provision Corp., Armour and Co., Bowman Dairy, Central Cold Storage Co., Central Ice Cream Co., Construction News—F. W. Dodge Corp., A. Epstein and Sons, Architects and Engineers, Raymond Lowey & Assoc., Architects, Peter Hand Brewery Co., Smith-Brubaker & Egan, Swift and Co., U. S. Cold Storage Co., U. S. Corps of Engineers, both 9th Corps Area and Great Lakes Division, and Western Refrigerating Co.

Now! Snow-ice perishables at 45 tons per hour

New LINK-BELT Series 500 Ice Crusher-Slinger opens new, larger markets for you

THERE'S new profit ahead for you when you offer modern, efficient top-icing with Link-Belt's Series 500 Ice Crusher-Slinger. Fast, positive refrigeration provides the exacting protection that produce shippers demand.

Newest of the complete Link-Belt line, the Series 500 helps maintain ideal shipping temperatures. Produce reaches its destination in top condition . . . with no deterioration or loss of quality.

Book 2443 can answer all your questions about Series 500 Ice Crusher-Slingers. For information on other models—from 15 to 60 tons per hour capacity—get Book 2382. Write or call your nearest Link-Belt representative.

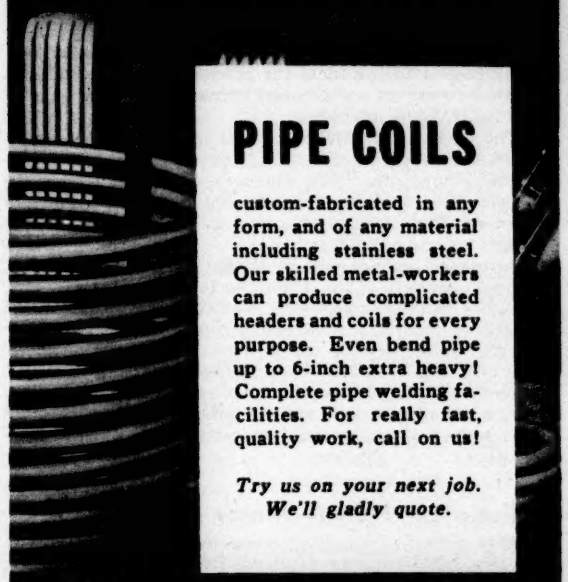
13,205

LINK-BELT

ICE CRUSHER-SLINGERS

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle; Scarboro, Toronto and Elmira, Ont. (Canada); Springs (South Africa); Sydney (Australia). Sales Offices in Principal Cities.

PIPE BENDING EXPERTS



PIPE COILS

custom-fabricated in any form, and of any material including stainless steel. Our skilled metal-workers can produce complicated headers and coils for every purpose. Even bend pipe up to 6-inch extra heavy! Complete pipe welding facilities. For really fast, quality work, call on us!

Try us on your next job. We'll gladly quote.

CHICAGO NIPPLE MFG. CO.
1997 CLYBOURN AVE., CHICAGO 14, ILL.

ACME . . . *the Only Gas Mask With the* 'PICTURE WINDOWS'

You never have that "jammed-in" feeling, wearing the Acme Full-Vision Gas Mask. Its patented, larger lenses are like picture windows, giving you full natural vision for that safe, unconfined feeling. When you walk, you can actually see your toes without bobbing your head. This factor alone makes Acme outstanding among gas masks . . . well worth looking into.

Write for the complete story on Acme Gas Masks for The Refrigeration Industry

Acme Protection Equipment Co.
3037 West Lake Street, Chicago 12, Illinois

YOUR FUTURE MAY BE ON THIS PAGE!

You are an experienced manufacturer's agent, thoroughly familiar with the refrigeration industry and many of its branches. You are accustomed to well-above-average-earnings and you take enough pride in your profession that you will only represent the finest of products. If you fit this description, your future is on this page.

EXCLUSIVE TERRITORIES NOW OPEN TO REPRESENT Onazote EXPANDED HARD BOARD CELLULAR RUBBER THERMAL INSULATION

Internationally famous British Xylonite, Inc. is now embarking on a large scale program to further expand the American recognition of ONAZOTE as the finest commercial thermal insulation yet developed. Qualified manufacturer's agents will not only be offered unusually high compensation, but will also receive the fullest backing in national advertising, sales promotion material, etc.

THERE'S NO BETTER THERMAL INSULATION THAN Onazote

CONSTANT LOW CONDUCTIVITY—The lowest thermal conductivity of any solid material known (0.20 B.T.U.s)

STRUCTURALLY STRONG — Ideal for self-supporting insulating walls and ceilings and for panel construction. ONAZOTE will not settle.

MOISTURE RESISTANT — Zero moisture pick-up. Also resistant to insects, rodents, rot, mildew, etc.

EASY TO HANDLE — ONAZOTE is light (4 pounds per cubic foot). It can be cut, drilled, planed, etc. with ordinary wood-working tools.

STANDARD BOARD SIZES — (*all thicknesses solid non-laminated*)

2 inch thickness in 4' x 1', 4' x 3', 3' x 1'.
1½ inch thickness in 4' x 1'.
1 inch thickness in 4' x 1'.

Onazote IS NEEDED *in all refrigeration industries!*

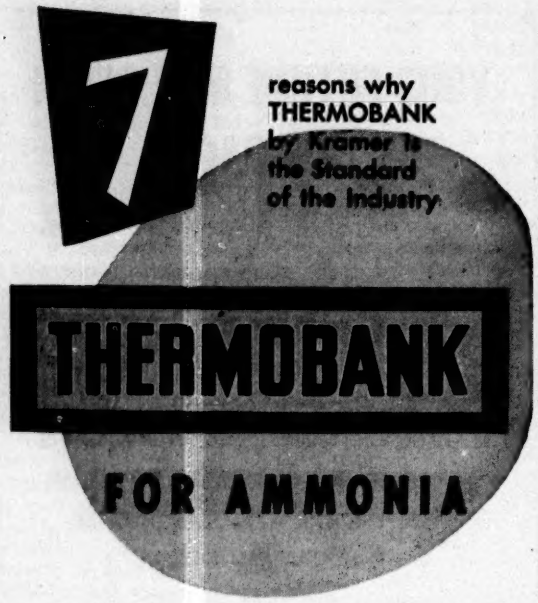
Here are just a few of the places where ONAZOTE may now be found . . .

ICE PLANTS • FROZEN FOOD LOCKERS
ICE STORAGE UNITS • BEVERAGE PLANTS
REFRIGERATED TRUCKS • ICE CREAM PLANTS
MILK AND ICE CREAM TRUCKS

THE POTENTIAL IS UNLIMITED!

Take advantage now of this unusual opportunity to reap big earnings with a top insulation product. Write for further information, including a brief outline of your past experience.

BRITISH XYLONITE, INC.
754 Lexington Ave., Brooklyn 21, N.Y.



The unequaled completely automatic defrosting system for temperatures below 32°

1. **COMPLETELY AUTOMATIC**
   It requires absolutely no manual attention. The coil is always frost free — automatically.
2. **PART OF LARGE SYSTEM**
   It may become part of large existing systems without affecting the operation of the other evaporators.
3. **MAXIMUM EFFICIENCY**
   Positive operating economy is provided by a "frost free" coil, using the patented KRAMER ICE COAT CONTROL.
4. **FLOOR SPACE ECONOMY**
   The KRAMER AMMONIA THERMOBANKS are ceiling mounted and therefore take no precious floor space. All defrosting devices are outside the refrigerated space.
5. **SIMPLICITY**
   Minimum controls — standard, time-tested and easily obtainable — are used in the KRAMER AMMONIA THERMOBANK.
6. **NO DRAIN FREEZE-UPS**
   Drain pan and drain line are heated during defrost, eliminating any drain line freeze-ups.
7. **TEMPERATURE CONTROL**
   Uniformity of temperature is made possible by the shortest-time defrost, characteristic of THERMOBANK.

WRITE NOW FOR BULLETIN NO. TA-182

KRAMER TRENTON CO.
Trenton 5, N.J.

Carrier Contest Attracts 855 Architects

EIGHT hundred and fifty five architects, architectural draftsmen and students of architecture, representing every state in the nation, have submitted entries in the Carrier Weathermaker Home Competition, it has been announced by Harold R. Sleeper, F.A.I.A., professional advisor to the competition. The competition, sponsored by Carrier Corporation, will pay cash prizes totalling $27,800. Its purpose is to stimulate the production of new designs for year-round air conditioned houses which can be constructed by home builders.

"The tremendous interest in this contest for homes designed around air conditioning is unprecedented in architectural competition," Mr. Sleeper said. "It indicates the sudden new acceptance of residential air conditioning, and may well serve to develop a new direction in houses and designs for home builders."

The contest entries will be judged by a jury consisting of three members of the American Institute of Architects, a builder and a housewife. Awards will be based on esthetic considerations—stressing good planning for house and site, suitability for use in a home builder's development and skill in achieving economies in plan, design and equipment due to the factor of year-round air conditioning.

Prize winning designs will be published and offered by Carrier Corporation to builders, contestants and the general public.

Bulletin on NEMA Motor Standards

A NEW bulletin containing complete information on the new NEMA motor standards has been announced as available from the General Electric Company, Schenectady 5, N. Y. The standards, passed by NEMA on May 19, set up new frame dimensions for a-c motors from 1 to 30 horsepower.

Designated as GEA-5995, the eight-page two-color publication compares the old with the new frame assignments for open-type poly-phase, single-phase, and wound-rotor motors as well as totally-enclosed fan-cooled types. Also listed are the suggested new frame assignments for foot-mounted and flange-mounted motors, and standards for minimum locked-rotor torque for general purpose single-phase motors.

Booklet on Foamglas

A NEW 24 page booklet, "Foamglas: low Temperature Space Insulation for Walls, Ceilings, Floors," has been published by the Pittsburgh Corning Corporation. It contains information about the many application methods for Foamglas on ceilings, walls and floors. It lists finishes, suggested thicknesses, insulation values (in typical contruction) and properties of Foamglas. The material is presented in an easy to read and follow fashion with many illustrative drawings, and pictures showing actual installations. The booklet is available from the Pittsburgh Corning Corporation, One Gateway Center, Pittsburgh, Pa.

Anhydrous Ammonia Equipment

A SPECIAL anhydrous ammonia catalog No. 801, with particular attention to valves and steel fittings for soil fertilization and industrial equipment has been issued by Henry Valve Company, Melrose Park, Ill. The 16-page booklet describes and illustrates the various values and fittings, all of which have been designed and developed especially for anhydrous ammonia service.

Bulletin on Safety Valves

A BULLETIN on safety valves has been issued by The Frick Company, Waynesboro, Pa. The new type A F safety valve it is explained, has been tested and approved for use with various refrigerants by the National Board of Boiler and Pressure Vessel Inspectors. The Bulletin includes tables of capacities, a valve selection table and other data, including discharge capacitors.

THE BUYERS DIRECTORY

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ABSORBERS
Vogt Machine Co., Henry, Louisville, Ky.

AIR CONDITIONING EQUIPMENT
Carrier Corp., Syracuse, N. Y.
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Niagara Blower Co., New York, N. Y.

AMMONIA COMPRESSOR VALVES
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Voss, Inc., J. H. H., New York, N. Y.

AMMONIA COMPRESSORS
Creamery Package Mfg. Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc. Chicago, Ill.
Enterprise Equipment Corp., Yonkers, N. Y.
Frick Co., Waynesboro, Pa.
Kehoe Machinery Corp., Newark, N. J.
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Vogt Machine Co., Henry, Louisville, Ky.
York Corp., York, Pa.

AMMONIA CONTROL DEVICES
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Kramer Trenton Co., Trenton, N. J.

AMMONIA FLOAT VALVES
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Frick Co., Waynesvoro, Pa.
Phillips & Co., H. A., Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.
York Corp., York, Pa.

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du Pont de Nemours & Co., Inc., E. I., Polychemicals Dept., Wilmington, Del.
Nitrogen Div., Allied Chemical & Dye Corp., New York, N. Y.

AMMONIA MASKS
Acme Protection Equipment Co., Chicago, Ill.

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Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
International Salt Co., Inc., Scranton, Pa.
Vogt Machine Co., Henry, Louisville, Ky.
York Corp., York, Pa.

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National Pipe Bending Co., New Haven, Conn.
Reynolds Mfg. Co., Springfield, Mo.
Vogt Machine Co., Henry, Louisville, Ky.
York Corp., York, Pa.

AMMONIA VALVES & FITTINGS
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Frick Co., Waynesboro, Pa.
Shank Co., Cyrus, Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

ARCHITECTS AND ENGINEERS
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Ophuls & Associates, Fred, New York, N. Y.

ASPHALT PRODUCTS
American Bitumuls & Asphalt Co. San Francisco, Calif.

AUTOMATIC CONTROL DEVICES
Alco Valve Co., St. Louis, Mo.
Armstrong Machine Works, Three Rivers, Mich.
Frick Co., Waynesboro, Pa.
Phillips & Co., H. A., Chicago, Ill.
Rex Engineering & Sales Co., Oklahoma City, Okla.
York Corp., York, Pa.

BAGS, ICE
Index Coupon & Supply Co., La Porte, Ind.
Union Bag & Paper Corp., New York, N. Y.

BAGS, WATERPROOF PAPER
Index Coupon & Supply Co., La Porte, Ind.
Union Bag & Paper Co., New York, N. Y.

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Martocello & Co., Jos. A., Philadelphia, Penna.
Vogt Machine Co., Henry, Louisville, Ky.

BLOWERS
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Roots-Connersville Blower Corp., Connersville, Ind.

BOILERS
Vogt Machine Co., Henry, Louisville, Ky.

BOILER TUBES
Byers Co., A. M., Pittsburgh, Pa.

BOOKS—TECHNICAL
Nickerson & Collins Co., Chicago, Ill.

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The POLAR Aluminum Ice Vending Station SELLS Cubed or Crushed Ice

★ A COMPACT PACKAGE UNIT! Shipped completely assembled and wired; ready to operate. Cabinet is 4'2" wide x 9' long.

★ BEAUTIFUL IN APPEARANCE! Heavy gauge embossed aluminum exterior always looks bright and new. Requires no upkeep.

★ ECONOMICAL TO OPERATE! Aluminum exterior reflects 97% of all radiant heat.

BELT CAPACITY
40 Ten-pound Bags only

STORAGE
200 Ten-pound Bags

Only $1680.00
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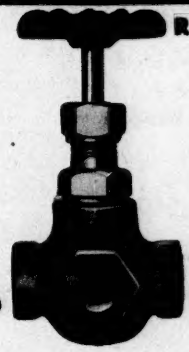
Write today for descriptive literature & prices on the complete line of POLAR Ice Stations, Ice Vending Equipment. Dept. 753.

REFRIGERATION ENGINEERING CO.
MONTGOMERY, MINNESOTA

shank AMMONIA VALVES AND REFRIGERATION PRODUCTS



SEMI-STEEL SHUT-OFF VALVE

Highest grade non-porous metal—full size ports—clean cut threads. Back seated stem — Shank design base—perfect alignment. Long life packing ring.

ALL-STEEL GAUGE SETS

All-Steel Construction. Automatic shut-off of liquid in case of glass breakage. Composition packing rings give long life, no-leak seal.

If your jobber doesn't stock—write

CYRUS SHANK CO.
629 W. Jackson Blvd. Chicago 6, Ill.

PERMANENT insulating efficiency water vapor resistance

VAPOR WALL

STYROFOAM®

LOW-TEMPERATURE PIPE INSULATION

CAN BE INSTALLED ON WET LINES

- costs less to buy and install
- costs next to nothing to maintain
- lasts indefinitely
- has a permanent K factor of .23 to .27
- sanitary

Immediate shipment can be made from stock of all common sizes of pipe and fitting covers. Write for free booklet and price information.

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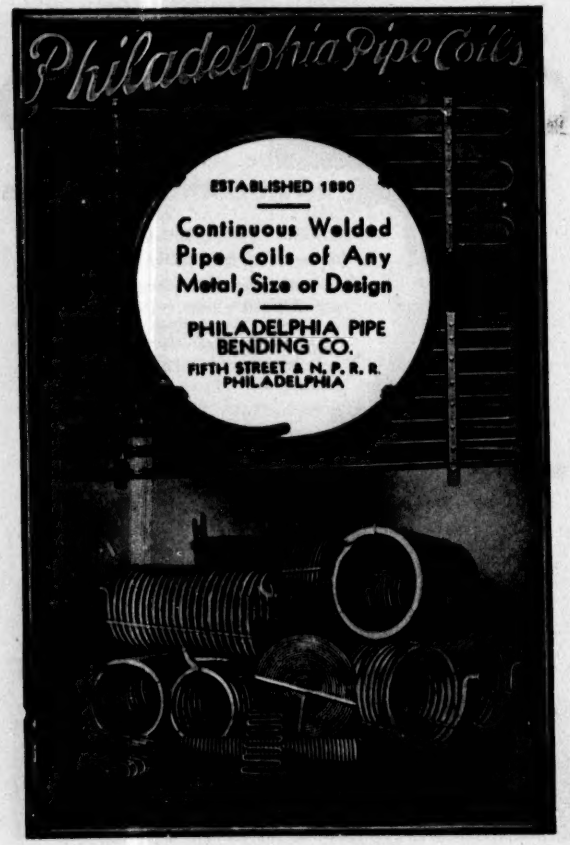
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Acme Industries, Inc., Jackson, Mich.

BRINE TREATMENT
International Salt Co., Inc., Scranton, Pa.

CALCIUM CHLORIDE
Solvay Process Div., The Allied Chemical & Dye Corp., New York, N. Y.

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Gifford-Wood Co., Hudson, N. Y.
Kehoe Machinery Corp., Newark, N. J.
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Reynolds Mfg. Co., Springfield, Mo.
Vogt Machine Co., Henry, Louisville, Ky.
York Corp., York, Pa.

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Vivian Mfg. Co., St. Louis, Mo.

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Lilly Co., The, Memphis, Tenn.
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Detroit Ice Machine Co., Detroit, Mich.
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Vogt Machine Co., Henry, Louisville, Ky.
York Corp., York, Pa.

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Armstrong Cork Co., Lancaster, Pa.
Frick Co., Waynesboro Pa.
Owens Corning Fiberglas Corp., Toledo, O.

COLD STORAGE DOORS
Butcher Boy Refrigerator Door Co., Harvard, Ill.
Jamison Cold Stge. Door Co., Hagerstown, Md.
Refrigeration Engineering Co., Montgomery, Minn.

COMPRESSORS
(See Ice Making and Refrigerating Machinery)

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Frick Co., Waynesboro, Pa.
Voss, Inc., J. H. H., New York, N.Y.

COMPRESSOR VALVES
Frick Co., Waynesboro, Pa.
Voss, Inc., J. H. H., New York, N.Y.

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Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Kehoe Machinery Corp., Newark, N. J.
King-Zeero Co., Chicago, Ill.
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Reynolds Mfg. Co., Springfield, Mo.
Vogt Machine Co., Henry, Louisville, Ky.
York Corp., York, Pa.

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Ophuls & Associates, Fred, New York, N. Y.

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Taylor Instrument Cos., Rochester, N. Y.

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Lilly Co., The, Memphis, Tenn.
Link-Belt Co., Chicago, Ill.

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United Cork Companies, Kearny, N.J.

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Vivian Mfg. Co., St. Louis, Mo.

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MMM, Inc., Houston, Tex.

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Vogt Machine Co., Henry, Louisville, Ky.

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Link-Belt Co., Chicago, Ill.

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Lewis-Shepard Products, Inc., Watertown, Mass.
Lilly Co., The, Memphis, Tenn.
Link-Belt Co., Chicago, Ill.

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(See Architects and Engineers)

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Frick Co., Waynesboro, Pa.
Niagara Blower Co., New York, N. Y.

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Creamery Package Mfg. Co., Chicago, Ill.
Niagara Blower Co., New York, N. Y.
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Owens Corning Fiberglas Corp., Toledo, O.

FIELD ICE SAWS
Gifford-Wood Co., Hudson, N. Y.

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York Corp., York, Pa.

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Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
York Corp., York, Pa.

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Henry Valve Co., Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky.

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Frick Co., Waynesboro, Pa.

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Frick Co., Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.

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Knickerbocker Stamping Co., Parkersburg, W. Va.

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Caterpillar Tractor Co., Peoria, Ill.

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Niagara Blower Co., New York, N. Y.

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Vivian Mfg. Co., St. Louis, Mo.

ICE BLOWERS
Gifford-Wood Co., Hudson, N. Y.
Link-Belt Co., Chicago, Ill.

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Ice plant Equipment Co., Inc., Philadelphia, Pa.
Kehoe Machinery Corp., Newark, N. J.
Knickerbocker Stamping Co., Parkersburg, W. Va.
Ohio Galvanizing & Mfg. Co., Niles, Ohio

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Knickerbocker Stamping Co., Parkersburg, W. Va.
Ohio Galvanizing & Mfg. Co., Niles, Ohio
Vogt Machine Co., Henry, Louisville, Ky.

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Link-Belt Co., Chicago, Ill.

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Lilly Co., The, Memphis, Tenn.
Link-Belt Co., Chicago, Ill.
Refrigeration Engineering Co., Montgomery, Minn.

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Detroit Ice Machine Co., Detroit, Mich.
Enterprise Equipment Corp., Yonkers, N. Y.
Frick Company, Waynesboro, Pa.
Howe Ice Machine Co., Chicago, Ill.
Ice plant Equipment Co., Inc., Philadelphia, Pa.
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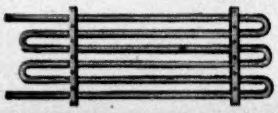

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Frick Co., Waynesboro, Pa.
Kehoe Machinery Corp., Newark, N. J.

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Ice Plant Equipment Co., Inc., Philadelphia, Pa.
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Lilly Co., The, Memphis, Tenn.
Vivian Mfg. Co., St. Louis, Mo.

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Refrigeration Engineering Co., Montgomery, Minn.

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Refrigeration Engineering Co., Montgomery, Minn.
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MMM, Inc., Houston, Tex.
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Pittsburgh Corning Corp., Pittsburgh, Pa.
United Cork Companies, Kearny, N.J.

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Rex Engineering & Sales Co., Oklahoma City, Okla.

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OILS, FUEL
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Vogt Machine Co., Henry, Louisville, Ky.
York Corp., York, Pa.

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Vogt Machine Co., Henry, Louisville, Ky.

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Frick Company, Waynesboro, Pa.
National Pipe Bending Co., New Haven, Conn.
Philadelphia Pipe Bending Co., Philadelphia, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

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Rex Engineering & Sales Co., Oklahoma City, Okla.
York Corp., York, Pa.

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Vogt Machine Co., Henry, Louisville, Ky.
York Corp., York, Pa.

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Vogt Machine Co., Henry, Louisville, Ky.
York Corp., York, Pa.

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Taylor Instrument Cos., Rochester, N. Y.

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Refrigeration Engineering Co., Montgomery, Minn.
S & S Vending Machine Co., San Jose, Calif.

REFRIGERATING AND ICE MAKING MACHINERY
(See Ice Making and Refrigerating Machinery)

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Wright Chemical Corp., Chicago, Ill.

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Perfection Ice Scoring Machine Co., Fort Worth, Texas

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York Corp., York, Pa.

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Vogt Machine Co., Henry, Louisville, Ky.
York Corp., York, Pa.

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Lilly Co., The, Memphis, Tenn.
Vivian Mfg. Co., St. Louis, Mo.

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Taylor Instrument Cos., Rochester, N. Y.

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Shank Co., Cyrus, Chicago, Ill.
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York Corp., York, Pa.

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Voss, Inc., J. H. H., New York, N.Y.

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Frick Co., Waynesboro, Pa.
Niagara Blower Co., New York, N. Y.
Vogt Machine Co., Henry, Louisville, Ky.

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International Salt Co., Inc., Scranton, Pa.
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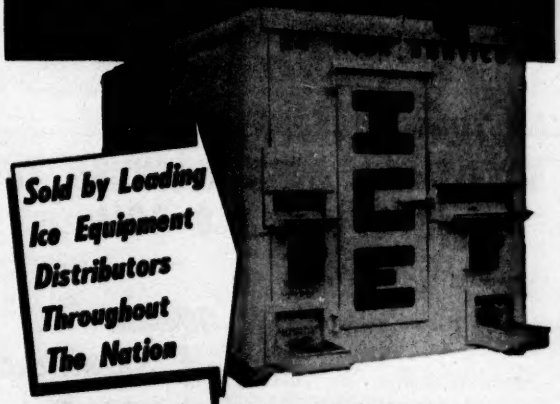

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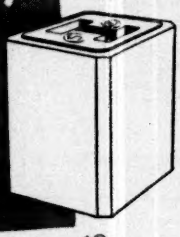

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1—9x9 ARTIC
1—10x10 FRICK
1—5x5 XL
1—7½x7½ YORK
1—9x9 FRICK
2—10x10 YORKS

2—70 ton horizontal SHELL AND TUBE CONDENSERS.
1—4¾x4 FRICK BOOSTER COMPRESSOR
2 sets twin 9x9 YORKS with 175 H.P. SYN. Motor
1 set twin 10x10 YORK 228 H.P. SYN Motor
1—self contained 4x4 FRICK
2,000 ICE CANS, all sizes
Ice plants 10-100 ton, YORK trunk coils, condensers, coolers, pipe fittings.

KEHOE MACHINERY CORP. TEL. BIGELOW 3-3231
337 JELLIFF AVENUE, NEWARK 8, NEW JERSEY

MOTOR DRIVEN—
MODEL MD-90-M
ADJUSTABLE GRATE

LITTLE GIANT
ICE BREAKERS

- SAVE TIME
- SAVE LABOR
- SAVE ICE

11 MODELS TO CHOOSE FROM

Write for descriptive circular

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BETTENDORF, IOWA

For Reliability and Economy

For long-time, dependable performance, always insist upon R-C Rotary Positive Blowers for new equipment or replacements. Send for Bulletin 21-B-37.

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VAN RENSSELAER H. GREENE
ENGINEERS

COMPLETE PLANT DESIGNS INCLUDING
BUILDING AND EQUIPMENT

11 PARK PLACE — NEW YORK 7, N.Y.

FRED OPHULS & ASSOCIATES,
Consulting Engineers

112-114 WEST 42nd ST. — NEW YORK CITY 36

Ice Making and Refrigeration - Industrial Power Plants
Reports, Appraisals and Management

Classified Advertising

All classified advertisements are payable in advance. Except for Positions and Help Wanted classifications, this section is reserved exclusively for USED equipment.

RATES: $4.00 for 50 words or less; 70c for each additional 10 words or fraction thereof; $1 per line for bold face headings; $10.00 per inch for line listings.

USED EQUIPMENT—wanted & for sale

FOR SALE—ACTV. CARBON AIR PURIFIERS
2 large activated carbon Pur Air air purifiers as manufactured by American Solvent Recovery Corp., Columbus, Ohio. These machines have been used 3 years and are guaranteed in perfect condition. Inspection invited. Jackson Ice & Cold Storage Co., Jackson, Ohio, Phone 258.

FOR SALE—Offering one Butcher Boy super freezer door with frame to fit wall opening 45½" wide, 61¾" high, 6" cork board. Galvanized 3 super seal fasteners. 1 set finger tip opener, completely metal clad with No. 26 gauge galvanized iron. Completely crated same as received from the factory. Original cost $354.75; will sell for 20% discount. F.O.B. Cleveland. Booth Fisheries Corporation, 1600 Merwin St., Cleveland 13, Ohio.

FOR SALE—6x6 high speed force feed lubrication, 7½x7½ York high speed belted to synchronous motor, with vee belts. 9x9 Frick direct connected to synchronous motor, 12x12 Frick direct connected to Ideal synchronous motor. Ice cans, condensers, brine coolers, agitators, blowers, electric cranes, complete ice plants. Parke Pettegrew & Son Co., 370 West Broad St., Columbus 8, Ohio.

FOR SALE—York 9 x 9 force lubrication with Troy steam engine, $900.00. Vilter 5½ x 5½, 25 h.p. motor, $500.00. 18 ft. shell and tube condenser, $400.00. Vogt shell and tube condenser, $200.00. Frick 6 x 6 $400.00. York 8 x 8, $500.00. Other sizes in stock; write us on anything in refrigeration. Gordon Equipment Co., 6530 W. Jefferson Ave., Detroit 17, Mich.

FOR SALE—One 9 x 9 York, completely overhauled, $500.00. Address Box JL-6 c/o Ice and Refrigeration, 435 N. Waller Ave., Chicago 44.

FOR SALE—3 x 3, 4 x 4, 5 x 5 self-contained Yorks. 5 x 5 Frick. 7½ x 7½, 8 x 8 and 9 x 9 Yorks, splash lubrication. One 15 ton Acme shell & tube condenser. One 3 ton York flake ice maker with bin and Freon compressor. Receivers, all sizes. Write E. Niebling, 1546 St. Clair Ave., Mt. Healthy, Cincinnati 31, Ohio.

FOR SALE—648 can Frick tank with herringbone coils, 50" ice cans nearly new, 6 can three motor crane—9x9 four year old Frick compressor—6x6 Frick compressor with 20 h.p. motor and complete 330 can Frick tank with 50" nearly new cans. Shawnee Ice Co., Shawnee, Okla.

FOR SALE—Practically new 9½ x 9½ Vilter ammonia ice machine, complete with 100 h.p. electric motor all controls and control panel. I first class condition. A real bargain at our price. Lakeside Steel Improvement Co., 5418 Lakeside Ave., Cleveland 14, Ohio.

FOR SALE—COMPLETE ICE PLANTS
50 ton, 14 can pull; 35 ton, Diesel Drive 6 can pull; 25 ton, 5 can pull.

AMMONIA COMPRESSORS
12½ x 14½ York, ⅓ and ⅔ capacity control.
10 x 10 York, 300 r.p.m.
8 x 8 York, V-belt drive to 75 h.p. motor.
7½ x 7½ York, V-belt drive to 60 h.p. motor.
6 x 6 York high speed.
3 x 3 York, self-contained unit.
11½ x 8 Frick booster compressor, V-belt drive to 50 h.p. motor.

MISCELLANEOUS EQUIPMENT
130 h.p., 3 cylinder Superior Diesel engine, 600 r.p.m. 75 h.p. motor, 720 r.p.m. Uline scoring machine. Gifford-Wood ice sizing unit; Type 50 F&E cubing machine. Blowers, agitators, M.G. sets. Ice cans 11½" x 22½" x 44" low pressure, 11½" x 22½" x 45" high pressure.

JOHN F. CARSON
"A" & Venango Sts. — Philadelphia 34, Pa.
Phone GArfield 6-2221

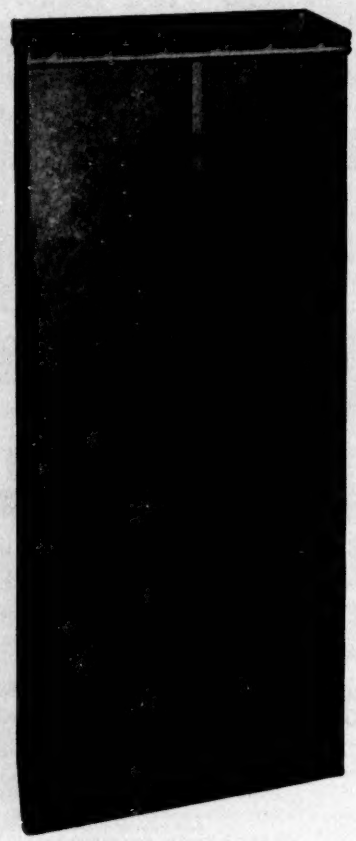
FOR SALE
USED ICE PLANTS AND REFRIGERATING EQUIPMENT
Complete ice plants—10-50 ton.
Ammonia compressors—all sizes.
Valves and fittings.
Condensers, brine coolers, ice cans.
B & E REFRIGERATING CO.
2 ORANGE ST., NEWARK 2, N. J.
Phone: MItchell 3-7790 Cable address "BERECO"

ADDED PROFITS—Dealerships now open for Metl-Bottom Ice Bags and Icessories. Lucrative territories available to energetic dealers. Contact us NOW for details. The Wagner Awning & Manufacturing Co., 2658 Scranton Road, Cleveland 1, Ohio. Phone TOwer 1-5400.

FOR SALE—Used coils. About 7,500 feet of 1¼ inch black pipe continuous welded ammonia coils; about 20 foot lengths. Price 8c per foot, F.O.B. Dyersburg. Coils are in good usable condition. Contact Wilson Fly, P.O. Box 5506, Memphis, Tenn., Phone 36-6313.

WANTED—Three 12 x 12 VSA ammonia compressors 300 r.p.m., or up to four machines totaling same capacity; with or without motors; 440 volt, 60 cycle. Globe Ice Co., P.O. Box 122, El Paso, Texas.

FOR SALE — USED ICE PLANTS AND REFRIGERATING EQUIPMENT
1—90 ton Your Evaporative Condenser
1—60 ton Ice Plant, Electric Driven
1—100 ton Ice Plant, Diesel Driven
1—120 ton Ice Plant, Electric Driven
5,000 11" x 22" x 47" 300 lb. Ice Cans, Excellent Condition.
1,000 11" x 22" x 51" 300 lb. Ice Cans, Excellent Condition.
2 10" x 10" York Ammonia Compressors, Medium and High Speed.
3 12½" x 14½" York Ammonia Compressors
AMMONIA COMPRESSORS:
3" x 3" to 12½" x 14½".
Shell and Tube Ammonia Condensers, Brine Coolers, Receivers, Traps, Valves and Fittings.
1 Miller Perfection Ice Scoring Machine
Write, wire or cable us on any equipment you need.
ENTERPRISE EQUIPMENT CORPORATION
77-79 Alexander Street — Yonkers, New York
Yonkers 8-8118-9 — Cable Address: ENEQCO



Welded Cans
Integral Tube Cans
Arctic Pownall Cans
Can Baskets
Condenser Trough

• • • • • • • • • • •

Industrial Trucks and Trailers

THE OHIO GALVANIZING & MFG. CO.
NILES OHIO

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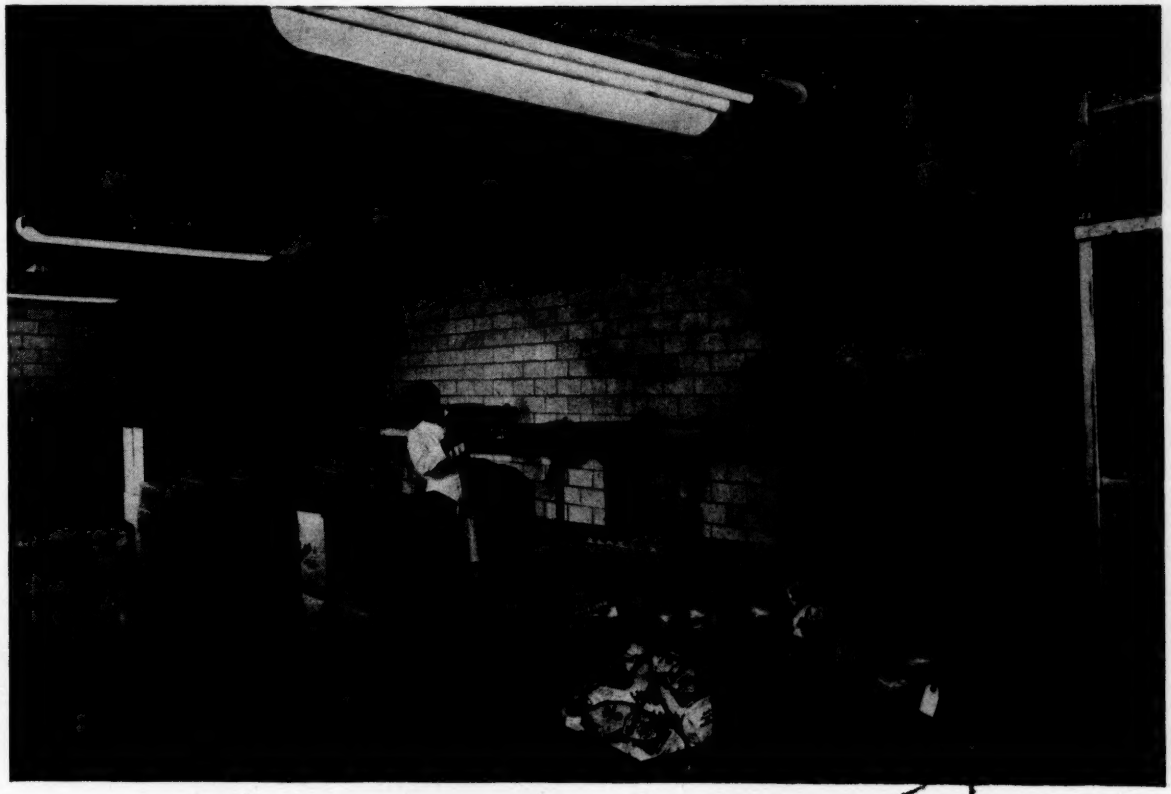


How old is the cork insulation behind this tile wall?

☐ 12 YEARS?
☐ 22 YEARS?
☐ 32 YEARS?

If you are not already familiar with the long life of corkboard insulation you may be surprised to learn how long cork lasts. Here, for example, is a packing station in the order-assembly department of Albert F. Goetze, Inc., meat packing plant in Baltimore, Md. The Armstrong's Corkboard behind the tile is 22 years old.

But there's even more to the story than that. In 1951 this room was converted from a packing floor. And that's when the tile was installed—right over the cork wall that had been erected in 1931.

At the time of the conversion, according to Mr. Albert F. Goetze, Jr., the cork insulation was perfectly dry. There was no bulging or buckling. It was entirely practical to apply the tile directly over the original corkboard wall.

You can always count on long, trouble-free performance when corkboard insulation is installed with careful attention to all the details that might affect service life. This example is but one of many hundreds where cork is still on the job after 20, 30, and even 40 years.

Call in Armstrong whenever you need low-temperature insulation. Our complete contracting service will do the entire job for you—from specification to installation. You'll get a thoroughly professional job, backed by a responsible organization with a reputation for quality work. For more information, call your nearest Armstrong office or write to Armstrong Cork Company, 2007 Skye Drive, Lancaster, Pennsylvania.

Complete Insulation Contract Service

There are many factors that can't be written into an insulation contract, but which can largely determine whether or not the agreement will be entirely satisfactory. They include:

1. Financial responsibility—resources to complete the contract despite any unforeseen events.
2. Integrity—a reputation for quality work and for prompt settlement of any justified complaints.
3. Technical ability — experience, plus technical and research staff to do the job in accordance with best practices.
4. Manpower resources — trained supervisors and workmen able to handle any contract efficiently.
5. Efficiency — ability to deal with problems of accounting, tax provisions, insurance, and workmen's compensation.

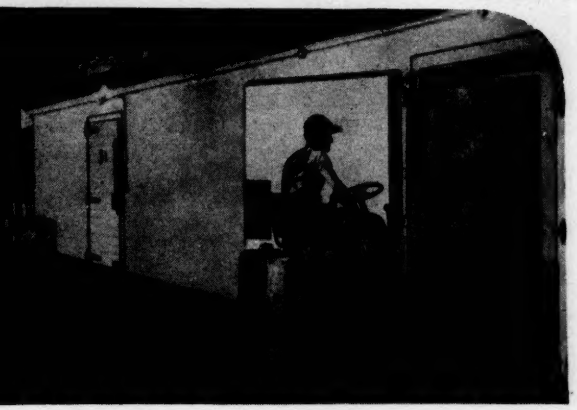
You get all these with an Armstrong Contract

ARMSTRONG'S INDUSTRIAL INSULATIONS

For temperatures from 300° below zero to 2800° F.

JAMISON DOORS

selected for HARD USAGE



Associated Grocers of Oklahoma make selection after detailed study

Every grocery distributor recognizes the importance of speed in handling perishables. And every warehouse manager knows too that speed in a warehouse can result in high maintenance and operating costs of cold storage rooms.

To make sure their cold storage rooms operated at maximum efficiency, the Associated Grocers of Oklahoma made a detailed study of all types of doors before making a final selection. Jamison Doors were selected because:

1. Jamison Cold Storage Doors provide highest sealing efficiency available anywhere.
2. Jamison Vestibule Doors insure a minimum escape of cold air from rooms during in-and-out traffic.
3. Construction of Jamison Cold Storage Vestibule Doors provides maximum protection against rough usage by materials handling equipment.

Jamison Doors invite and challenge comparison. Compare the construction features of these doors yourself. Write today for catalog. JAMISON COLD STORAGE DOOR CO., HAGERSTOWN, MD., U.S.A.

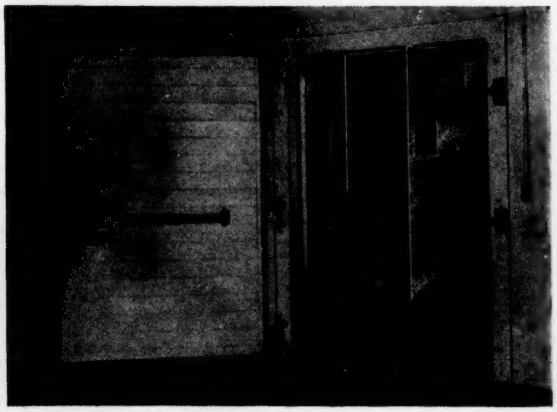
JAMISON

HAGERSTOWN, MARYLAND, U. S. A.

The leader for over 50 years

5'6" x 7'6" DOORS PROVIDE ADEQUATE CLEARANCE FOR ELECTRIC TRUCKS. Truck operator nudges door open without dismounting. Heavy No. 14 gauge galvanized sheet steel protects lower four feet of Vestibule Doors. Upper portion of doors is protected by No. 20 gauge steel.

BUMP OPEN BAR OPENS COLD STORAGE DOOR FROM INSIDE. A push on the vestibule door from the inside contacts the bump open bar. As bar is depressed, fastener releases hold on door. Doors can be opened from inside without manually operating the fastener. Mr. M. Rabinowitz, Gen. Mgr. of Associated Grocers, points to Bump Open Bar.



HEAVY COLD ROLLED STEEL SHAFT SUPPORTS DOORS FROM TOP TO BASE. A two-way gravity cam automatically closes batten doors, keeping loss of cold air at a minimum during in-and-out traffic.